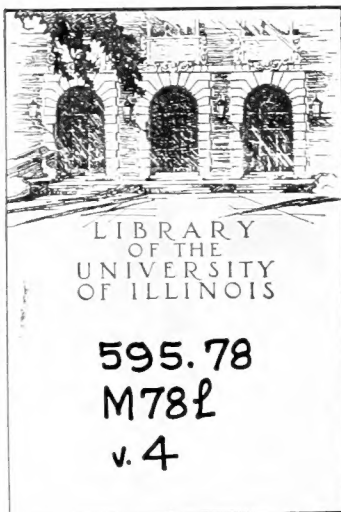


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# LEPIDOPTERA INDICA.



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BY

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VOL. IV.

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# LEPIDOPTERA INDICA.



## Sub-family NYMPHALINÆ (*continued*).

### Genus BIMBISARA.

*Bimbisara*, Moore, Lep. Indica, iii. p. 146 (1898).

*Neptis* (part), Auctorum.

*Neptis* (sect. 2, part), Felder, Neues Lep. p. 30 (1861).

IMAGO.—Wings comparatively more elongated and narrower than in the species of typical *Neptis* (*Aceris*, etc.). *Forewing* elongated, subtriangular; costa slightly arched from the base, exterior margin slightly oblique and scalloped, posterior margin strongly recurved; first subcostal branch emitted at one-third before end of the cell, second at one-ninth before the end; discocellulars extremely short, both outwardly-oblique; cell open; lower median emitted at half-way before the opposite discocellulars. *Hindwing* elongate, triangular; anterior margin very convex and oblique apically, exterior margin very obliquely convex, scalloped; with a broad glossy-white costal band and a medially-disposed unglossed brownish-grey patch extending from costal vein to below base of subcostals; costal vein ending at about one-fourth before the apex; precostal vein short, bent outward near end; subcostal branch and radial at a lengthened but equal distance from the costal vein; cell area broad, open. *Body* moderately stout; palpi slender, laxly hairy; antennæ with a lengthened slender club; eyes naked.

TYPE. B. Sankara [*Amba*].

### BIMBISARA CARTICA.

*Neptis Cartica*, Moore, Proc. Zool. Soc. 1872, p. 562, ♂ ♀. de Nicéville, Butt. of India, etc., ii. p. 89 (1886)—*Dry-season*.

*Neptis Carticoides*, Moore, Trans. Ent. Soc. 1881, p. 309. de Nicéville, l.c. p. 90 (1886)—*Wet-season*.

*Dry-season brood* (Plate 287, fig. 1, 1a, b, ♂ ♀).

IMAGO.—Male and female. Upperside dark fuliginous-black, with blacker  
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intervening spaces between the veins; cilia slightly alternated with white; markings fuliginous-white. *Forewing* with an elongated discoidal streak, which is broadly indented at upper end of the cell; a transverse discal excurved macular band, composed of three subapical spots, of which the upper is minute, slender, and divided by the third subcostal veinlet, the two next somewhat elongate, and decreasing in size, and four lower spots, the first of which is between the upper and middle medians, small and dentate, the second larger and broadly conical, the third broadly triangular, the lowest being narrow and slightly expanded on the posterior margin; these are bordered outwardly by a slender pale brownish-white inner-submarginal wavy line, a broader submarginal lunular line—which is almost white in the female, and then by a marginal slender line. *Hindwing* crossed by a broad inner-discal band, and a narrower more diffused outer band, between which is a pale brown medial-discal sinuous fascia, and beyond a marginal slender line. Underside dark ferruginous; markings as above, tinged with pinkish-white, the three marginal lines on *forewing* more prominent and lilacine-white. *Hindwing* also with a broad basal pinkish-white band, the medial discal sinuous fascia and marginal line lilacine-white. *Body* and palpi above, blackish; palpi and thorax beneath, forelegs and middle and hind femora pale grey; abdomen beneath and middle and hind tibiae and tarsi pale greyish-ochreous; antennae blackish above, tip and beneath reddish.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{8}{10}$  inches.

*Wet-season brood* (Plate 287, fig. 1, c, d, ♂).

IMAGO.—Male. Smaller than dry-season form; markings similar. Upperside dark fuliginous-brown, with blackish intervening spaces between the veins. *Forewing* with a narrower and more sullied fuliginous discoidal streak and subapical spots, the latter being smaller, the lower discal spots half the size of those in dry-season examples, the upper one being minute, the next triangular, and the two lower narrow. *Hindwing* with the inner-discal white band narrower, the outer-discal band much sullied with fuliginous. Underside of a darker ground-colour than *dry-season* form, the markings narrower, as above, otherwise the same.

Expanse, ♂ 2 inches.

HABITAT.—Nepal; Sikkim; Khasia and Naga Hills.

DISTRIBUTION.—Several specimens of the dry-season form were taken in Nepal by the late General G. Ramsay, of which we possess examples of both sexes. Mr. de Nicéville records it as “rather a rare species in Sikkim, but occurs from April to October” (*l.c.* 89). “It is found in the lower valleys of Sikkim throughout the warm weather, but is certainly not a common species” (*id.* Sikkim Gaz. 1894, 137). Numerous specimens of the dry-season form have been received from the

Khasia Hills by Colonel C. Swinhoe. The type specimen of the wet-season form (*Carticoides*) and a second male, from Darjiling, is also in our possession. A male of the wet-season form is also in the British Museum, and one from Sikkim in Mr. W. Rothschild's collection. Mr. de Nicéville also records "a single male of the latter form, in the Indian Museum, Calcutta, taken in Sikkim by Mr. Otto Möller" (Butt. Ind. ii. 90).

Of our illustrations of this species on Plate 287, figs. 1, 1a, b, are from the type male and female *Cartica*—the dry-season form, and figs. 1, c, d, from the type male *Carticoides*—the wet-season form.

**BIMBISARA BURMANA** (Plate 287, fig. 2, 2a, ♂).

*Neptis Burmana*, de Nicéville, Journ. Asiatic Soc. Bengal, 1886, p. 251, pl. 9, fig. 9.

IMAGO.—Male. Upperside black, with prominent white markings. *Forewing* with the discoidal streak narrow and deeply indented (or entirely divided in some) at end of the cell; the discal series of spots well separated, somewhat smaller and more rounded than in *B. Cartica*, the three marginal lines distinct, but narrower, the middle line white. *Hindwing* with the inner-discal band somewhat narrower than in *B. Cartica*, the outer-discal band prominent, and somewhat macular; marginal line pale. Underside darker ferruginous than in *Cartica*, markings as above, all very prominent, and pinkish-white. *Hindwing* also with a broad pinkish-white basal band, and a slightly-defined medial discal sinuous fascia.

Female. Upperside as in male; the markings less prominent and somewhat sullied-white. Underside as in male.

Expanse, ♂  $2\frac{1}{10}$ , ♀  $2\frac{1}{10}$  to  $2\frac{8}{10}$  inches.

HABITAT.—Burma; Upper Tenasserim.

DISTRIBUTION.—Described by Mr. de Nicéville from two males in Col. Marshall's collection, "both taken by Capt. C. T. Bingham, one on the Donat Range in January, the other at Sekkam, Thoungyeen, in February" (de N. l.c. 251). Specimens of both sexes, taken at Tilin Yaw, February, March, and April, by Capt. E. Y. Watson, during the Chin-Lushai Expedition, are in the British Museum. Col. C. H. E. Adamson has a male taken at Toungya, Sekkam, in February. We possess two males from the Upper Mekong, Shan States, Burma, taken by Mr. R. Roberts, C.E.

**BIMBISARA NASHONA** (Plate 288, fig. 1, 1a, b, c, ♂ ♀).

*Neptis Nashona*, Swinhoe, Ann. and Mag. Nat. Hist. 1896, p. 357.

IMAGO.—Male and female. Upperside olivescant fuliginous-black; markings

fuliginous-white; cilia alternated with white. *Forewing* with an elongated entire discoidal streak which extends half-way along the upper median veinlet and slightly below its base; the subapical spots are well-separated and broader than in *pseudovikasi*, the three lower discal decreasing spots being rounded, the lowest not expanding on the margin; the inner submarginal line is lunular, not sinuous, the outer lines broader. *Hindwing* with the inner-discal band broader than in *pseudovikasi*, and somewhat macular, the outer-discal band being also much broader, diffused, and sullied; the marginal line distinct. Underside chestnut-red, paler than in *pseudovikasi*, with lower discal dusky intervening spaces; the markings as above, slightly broader and lilacine-white, the basal lilacine fascia broad and prominent; no subbasal fascia. *Body* and palpi above black; palpi and thorax beneath, forelegs, middle and hind femora grey; abdomen beneath, middle and hind tibiæ and tarsi pale greyish-ochreous; antennæ black, tip with red.

Expanse, ♂  $2\frac{4}{10}$ , ♀  $2\frac{7}{10}$  inches.

HABITAT.—Cherra Punji; Khasia Hills.

DISTRIBUTION.—So far as is yet known this species is restricted to the district of the Khasia Hills, from whence Col. C. Swinhoe has received numerous specimens.

### BIMBISARA SANKARA.

*Wet-season brood* (Plate 289, fig. 1, 1a, b, c, ♂ ♀).

*Limenitis Sankara*, Kollar, Hugel's Kaschmir, iv. 2, p. 428, ♀ (1844). de Nicéville, Butt. of India, etc., ii. p. 175 (1886).

*Athyma Sankara*, Westwood, Gen. D. Lep. ii. p. 274 (1850).

*Neptis Sankara*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 350.

*Neptis Amba*, Moore, Proc. Zool. Soc. 1858, p. 7, pl. 49, fig. 4, ♂. de Nicéville, Butt. India, etc., ii. p. 88 (1886).

IMAGO.—Male. Upperside fuliginous-black; markings white; cilia alternated with white. *Forewing* with an elongated discoidal streak, which is indented at the upper end of the cell; an excurved transverse discal broad macular band, composed of a slender costal streak divided by the second subcostal veinlet, two elongated subapical somewhat oval spots, a very small more or less obscurely defined dentate spot, a short small dentate spot, a large broad ovate spot, a broad triangular spot, and lastly a narrower longer spot on posterior margin; beyond is a submarginal obscure black-bordered pale brown lunular line, and a less distinct marginal slender line. *Hindwing* crossed by a broad inner-discal band, and a narrow outer-discal lunular band, followed by an indistinct pale brown marginal lunular line, the submarginal band being sometimes sullied with pale brown. Underside rich dark ferruginous; markings as above, but somewhat broader and all pinkish-white,

including the two marginal lunular lines on both wings. *Hindwing* also with a narrow pinkish-white basal and a subbasal fascia, and a less-defined medial discal sinuous fascia.

Female. Upperside as in male; markings the same, but in some examples slightly sullied yellowish-white. Underside as in male. *Body* and palpi above fuliginous-black; palpi and thorax beneath, forelegs, middle and hind femora greyish-white; abdomen beneath and middle and hind tibiæ and tarsi pale ochreous-white.

Expanse, ♂  $2\frac{8}{10}$ , ♀ 3 inches.

*Dry-season brood* (Plate 289, fig. 1d, e, f, g, ♂ ♀).

*Neptis Amboides*, Moore, Proc. Zool. Soc. 1882, p. 241, ♂ ♀.

Smaller than wet-season brood. Male. Upperside. Ground-colour duller black. *Forewing* with the discoidal streak broader, the discal spots also broader and more compactly disposed. *Hindwing* with the discal band broader. Underside ground-colour somewhat paler and duller coloured; markings broad, as above, otherwise as in wet-season.

Female. Upperside; ground-colour duller black than in wet-season, the markings sullied white. Underside as in male.

Expanse, ♂  $2\frac{3}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—Western Himalayas; Nepal.

NOTE.—We have identified Kollar's insect (*Sankara*) with that of *Amba*, from a coloured drawing of his type specimen in the Nat. History Museum at Vienna, kindly sent to us by Dr. Rogenhoffer.

DISTRIBUTION.—We possess a male of the wet-season form taken in Kashmir by the late Capt. R. Bayne Reed, two females from Naini Tal, and both sexes from Nepal, taken by the late Genl. G. Ramsay; we have also the type specimens of the dry-season form (*Amboides*), the males from Ruttun Pir, Kashmir, taken by Capt. Reed, and the female from Kangra, taken by the Rev. J. H. Hocking. There are specimens from Simla, Kangra, and Almora, in the British Museum. Mr. J. H. Leech possesses specimens from Sultanpur, Kulu, taken by Mr. A. G. Young, and from Dana, taken in August by Mr. MacArthur. Mr. L. de Nicéville records it as "a common species in Simla; specimens from Kulu Valley and Masuri are in the Indian Museum, Calcutta, and in Col. A. M. Lang's collection, from Kunawur. Mrs. Deane took it in Chini in June" (Butt. Ind. ii. 88). Mr. W. Doherty records it from the "Kali and Sarsu Valleys, 2000 to 5000 feet elevation, Kumaon" (J. A. S. Beng. 1886, 125).

HABITS OF IMAGO.—Mr. de Nicéville says that he "always met with it in beds of

streams" (Indian Agriculturist, July, 1880). Col. Lang states that "it has the same flight as *N. Astola*, but more fond of pitching on the ground in the shade of trees and rocks" (MS. Notes).

**BIMBISARA QUILTA** (Plate 290, fig. 1, 1a, ♂ (*dry-season*), fig. 1b, c, d, e, ♂ ♀ (*wet-season brood*).

*Neptis Quilta*, Swinhoe, Annals of Nat. Hist. 1897, p. 408, ♂ ♀.

IMAGO.—Male and female. Upperside olivescient-black, the veins outwardly lined with olivescient greyish-brown. *Forewing* with the discoidal streak, and transverse discal bands on both wings, as in *B. Sankara*, but all narrower, smaller, and less prominent, those of the male, in the *dry-season* brood, being sullied-white, and of both sexes in the *wet-season* brood more or less olivescient-white; in some freshly-captured females the bands being slightly tinted with very pale yellowish-ochreous; the outer marginal lunular lines brownish-grey. Underside darker purpurescent ferruginous-brown; all the markings similar, but comparatively narrower, as above, and less prominent.

Expanse, ♂  $2\frac{1}{10}$  to  $2\frac{8}{10}$ , ♀ 3 inches.

HABITAT.—Sikkim; Bhotan; Jaintia, Garro and Naga Hills; Burma.

DISTRIBUTION.—The type specimens are recorded from Cherra Punji; Colonel Swinhoe has also examples from the Jaintia and Naga Hills; a male from the Garro Hills is in Mr. W. Rothschild's collection. We have it also from E. Pegu, taken by Mr. W. Doherty, and from Bhotan, taken by Mr. G. C. Dudgeon. Specimens from Sikkim, taken by Mr. Dudgeon in June, and from E. Pegu, 500 to 2000 feet elevation, taken by Mr. Doherty in March and April, are in the British Museum.

NOTE.—The female of *Pantoporia Zeroca* is, apparently, a mimic of this species.

**BIMBISARA NAR** (Plate 288, fig. 2, 2a, ♀).

*Neptis Nar*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 349, pl. F. fig. 6, ♀.

IMAGO.—"Female. Upperside brownish-black, with blacker intervening bordering patches between the veins; cilia slightly alternated with white. *Forewing* with an elongated pale brownish-ochreous streak occupying lower half of the cell and joined to a discocellular triangular ochreous-white spot beyond; three subapical outwardly-oblique conjoined ochreous-white spots, their edges tinged with darker ochreous, the upper spot slender, very small; four inwardly-oblique ochreous-white spots, the two upper being discal, the others on posterior margin, the uppermost spot composed of a clump of ochreous scales only, the next rounded, the two



posterior divided by the submedian vein; beyond is a submarginal sinuous obscure pale brown line and then a marginal slender straight line. *Hindwing* crossed by a discal broad almost pure white band, which is anteriorly decreasing in width from the abdominal margin, but does not reach the costa; an obscure sullied brownish-ochreous narrower submarginal band, and a less defined narrow marginal line. Underside blackish-brown, with darker intervening spaces between the veins; all the white markings, as in upperside, suffused with pale violet-grey. *Forewing* with the discoidal streak entire, but indented anteriorly at end of the cell; the discal spots larger and whiter, the two outer lines broader, prominent, and purplish-white. *Hindwing* with a short basal costal pure white band, and a short subbasal pale violet-grey band, an outer discal narrow sinuous violet-grey band, the submarginal band and marginal line being also violet-grey. *Body* and palpi above brownish-black, abdomen with a broad pale violet-grey band; beneath and legs pale violet-grey.

Expanse, ♀  $2\frac{7}{10}$  inches.

HABITAT.—S. Andamans.

DISTRIBUTION.—Described by Mr. de Nicéville from two examples received from Mr. R. Wimberley, being the only specimens seen by him among many thousands of butterflies from Port Blair received during the last twelve years. A single female is in Mr. W. Rothschild's collection.

NOTE.—This species is probably mimicked by the female of *Pantoporia rufula*.

**BIMBISARA PSEUDOVIKASI** (Plate 291, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male and female. Both sexes comparatively larger than the Javan *Vikasi*. Upperside dark olivescient fuliginous-brown, with prominent blacker intervening discal patches. Darkest and more richly coloured on both upper and underside, and with more prominent markings, in the wet-season brood. *Forewing* with the indented discoidal pale sullied olivescient greyish-ochreous streak somewhat narrower, and its end more prolonged; the transverse discal excurved series of pale spots smaller, the subapical series being conspicuously narrower, slender and elongated in shape. *Hindwing* with the discal and both outer bands paler and slightly narrower. Underside brown with dark purple-brown interspaces between the markings; with all the bands, as above, comparatively narrower and purpurescent-white, the basal and subbasal pale lilacine fascia on hindwing distinct. *Body* and palpi above dark brown; palpi and thorax beneath, forelegs, middle and hind femora pale grey; abdomen beneath, middle and hind tibiæ and tarsi pale ochreous.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{8}{10}$  to 3 inches.

HABITAT.—Sikkim; Bhotan; Khasia and Garro Hills.

DISTRIBUTION.—We possess specimens from Sikkim, from Bhotan, taken by Mr. G. C. Dudgeon, and from Cherra Punji and Khasia Hills. A specimen from the Garro Hills is in Mr. W. Rothschild's collection. Colonel C. Swinhoe has received numerous examples from the Khasia Hills. Mr. de Nicéville records it, as *Vikasi*, as "a common species in Sikkim, occurring at low elevations almost throughout the year" (Sikkim Gazetteer, 1894, 137).

Mr. W. Doherty records *Vikasi* as "rare in the Sarju Valley at Kapkot, Kumaon, at 4000 feet elevation" (J. A. Soc. Bengal, 1886, 125). This latter locality may probably refer to the present species.

**BIMBISARA HARITA** (Plate 291, fig. 2, 2a, b, c, ♂ ♀).

*Neptis Harita*, Moore, Proc. Zool. Soc. 1874, p. 571, pl. 66, fig. 8, ♀. de Nicéville, Butt. of India, etc., ii. p. 92 (1886).

*Neptis Vikasi*, Distant, Rhop. Malayana, p. 152, pl. 16, fig. 13, ♀ (1883)—*nec* Horsf.

*Neptis Vikasi*, var. *Harita*, Distant, *id.* p. 444, pl. 43, fig. 8, ♂.

IMAGO.—Male and female. Upperside olivescient fuliginous-brown, with blacker intervening patches between the markings. *Forewing* with rather indistinct paler olivescient-brown narrow discoidal streak and dentate discocellular mark, two transverse discal series of obscure narrow pale black-bordered zigzag lunules, the upper and lower pair in each series being broadest, and the one between the middle and lower median of the inner series is broader and dentate in the female; and two submarginal similar slender lunular lines, these markings being somewhat more distinct in the female. *Hindwing* with a paler narrow inner-discal transverse band with dark outer border, beyond which is a blackish medial-discal macular fascia, and then a submarginal row of pale-bordered blackish dentate-lunules, these markings being most distinct in the female. Underside brighter olive-brown; markings as above; the cell-streak, discal, and outer lines being violet-white and most prominent in the female.

Expanse, 2 to 2 $\frac{1}{10}$  inches.

HABITAT.—E. Bengal; Assam; Cachar; Khasia Hills; Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—We possess the male and female type specimens from "Eastern Bengal." Mr. de Nicéville records "a single specimen in the Indian Museum, Calcutta, taken in the Dunseri Valley, Upper Assam, and a male from Cachar, taken in July by Mr. J. Wood-Mason" (Butt. Ind. 92). A female from Tezpore, Assam, is in Mr. R. H. F. Rippon's collection. Colonel C. Swinhoe possesses specimens from the Khasias. There are also Assam and Khasia examples in Mr. W.

Rothschild's collection. A female from Tounghoo, Burma, is in Mr. H. Grose-Smith's collection. A female taken by Mr. A. O. Hume at Malawoon, Burma, males from HOUNGDRAY Valley, Upper Tenasserim, taken in January by Capt. C. T. Bingham, and a female from Mergui, are in the British Museum Collection. Dr. J. Anderson also obtained it in the Mergui Archipelago in the cold season. Col. C. H. E. Adamson records specimens taken in Akyab, and Tenasserim (List, p. 20), of which we have examined examples from Tavoy, taken in November. The late Mr. A. R. H. Tucker took specimens at Andhiaza, north of Tavoy, nearly at sea-level, in October, 1891. A male from Malacca, taken by Capt. S. Pinwill, is in the British Museum. Mr. W. L. Distant records it from Province Wellesley, and Perak, in the Malay Peninsula (l.c. pp. 152, 444). Col. Swinhoe also has it from Perak, and Borneo. Mr. D. Cator possesses specimens taken at Sandakan, N. Borneo, in October, which we have verified.

Both sexes of this species may be distinguished from *B. Omeroda*, on the upperside, by its more obscurely defined markings, and on the forewing, in both the upper and underside, by the lower spots of the inner discal series being dentate in form, and on the hindwing by the submarginal row of blackish lunules.

**BIMBISARA ANJANA** (Plate 292, fig. 2, 2a, b, ♂ ♀).

*Neptis Anjana*, Moore, Trans. Ent. Soc. 1881, p. 309, ♂. de Nicéville, Butt. of India, etc., ii. p. 92 (1886). Distant, Rhop. Malayana, p. 445, pl. 36, fig. 11 (1886).

IMAGO.—Male. Upperside dark olivescient blackish-brown, with blacker intervening bordering patches between the veins; markings obscurely defined and of a sullied pale olivescient yellowish-ochreous; cilia slightly alternated with white. *Forewing* with a narrow elongated discoidal streak which is indented anteriorly above the middle median veinlet; a transverse discal excurved narrow macular band, the lower portion being very obliquely-disposed inward, the spots of the upper portion small, slender, but slightly dentate, those of the lower portion transversely narrow and ovate, the medial portion being linear; beyond is a submarginal very narrow lunular band, and a less-defined slender marginal line. *Hindwing* crossed by a narrow inner-discal band and a similar outer-discal recurved band, followed by a less-defined slender submarginal line. Costal border glossy violet-grey, extending medially to below the first subcostal veinlet and enclosing an oval pale ochreous-yellow patch of unglossed scales between base of costal vein and first subcostal. Underside dark purplish chestnut-red; discoidal streak and transverse bands, and lines, as above, but broader, and glossy purplish-white, or, in certain

lights, bluish-white. *Forewing* also with the discal interspaces darkest, and with a slender inner submarginal purplish-white lunular line. *Hindwing* also with a short basal purplish-white band, and a medial-discal sinuous band; each of the outer bands being also bent inward to the costa above the upper subcostal.

Female. Upperside as in the male, the markings somewhat broader and brighter pale olivescient yellowish-ochreous. Underside as in male.

Expanse, ♂  $2\frac{5}{10}$ , ♀  $2\frac{6}{10}$  inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—The type specimen was taken in Moulmain. A male from Meetan, and a female from Tenasserim taken in April by Col. Bingham, is in the British Museum. Mr. W. Doherty found it not uncommon in E. Pegu during March and April. "A male in the Indian Museum, Calcutta, was obtained by Col. C. T. Bingham in the Mepley Valley, Upper Tenasserim, and one from the Donat Range, taken in January, is in Major Marshall's collection" (de Nicéville, l.c. p. 92). It also occurs at Perak, Malay Peninsula. Specimens from Perak are in Col. Swinhoe's collection. Males from Labuan, and Sarawak, Borneo, are in the British Museum, and a male and female from Kinabalu, N. Borneo, is in Mr. W. Rothschild's collection. Mr. de Nicéville records it from Sumatra, where it is found only in the Hills at 3000 feet elevation" (J. As. Soc. Bengal, 1895, 409).

CHINESE AND INDO-MALAYAN SPECIES.—*Bimbisara Sinica* (Neptis Amba (part), Leech, Butt. of China, p. 199). Upperside blacker than in typical *Amba* (*Sankara*), the white discoidal streak on forewing and the two bands on hindwing comparatively narrower. On the underside these bands are also narrower, and there is only one narrow outer submarginal lunular line, in both sexes of *Amba* there are two. *Habitat*. W. China.—*Bimbisara Antonia* (Neptis Antonia, Oberthür, Etudes Entom. 1876, p. 22, pl. 4, fig. 3, ♂. *Syn.* Neptis Amba, var. Leech, Butt. China, p. 199, pl. 19, fig. 1, ♀ (1892). *Habitat*. Moupin, W. China.—*Bimbisara micromegethes* (Neptis micromegethes, Holland, Trans. Ent. Soc. Amer. 1887, p. 118. *Habitat*. Hainan.—*Bimbisara Omeroda* (Plate 292, fig. 1, 1a, b, c, ♂ ♀), Neptis Omeroda, Moore, Proc. Zool. Soc. 1874, p. 571). Male and female. Upperside dark olivescient fuliginous-brown, with blacker intervening spaces between the veins; banded with paler fuliginous brown; the upper series of transverse discal spots on forewing narrow, almost oval in the female, the lower series rounded in both sexes. Underside dull purpurescent-brown in male, brighter brown in female, with black intervening spaces between the markings, as above, the markings being pale fuliginous-brown in male and vioscent white in the female. Expanse, ♂  $2\frac{3}{10}$ , ♀  $2\frac{3}{10}$  to  $2\frac{4}{10}$  inches. *Habitat*. Penang; Singapore; Sumatra; Borneo. The type specimen of *Omeroda* now under examination, from Penang, a male from Sumatra

(Wallace) and a female from Singapore are in the Oxford University Museum. A male and female from Sumatra and a female from Borneo are in Mr. P. Crowley's collection. We possess both sexes from Borneo; females from Borneo and Sumatra are in Mr. H. Grose-Smith's collection. A male and female from Labuan, Borneo, are in the British Museum. Both sexes of *Omeroda* differ from the Javan species, *Vikasi*, on the upperside, in the discoidal streak, and discal bands, being comparatively narrower and of a pale fuliginous brown, in *Vikasi* they are sullied brownish-white; the discal series of spots on forewing are narrower, the lower spots being rounded, in *Vikasi* they are broadly dentate. On the underside the ground-colour is duller brown than in *Vikasi*, the streak and discal bands less prominent, especially in the male.—*Bimbisara Kheilii*. Male. Upperside olivescient fuliginous-brown, with blacker interspaces between the veins. *Forewing* with a very slender sullied-white discoidal streak and point beyond the cell; two prominent pure white subapical oblique spots and a lower discal rounded similar white spot between the middle and lower median veinlets; a very indistinct slender sullied brownish-whitish short outwardly-oblique streak above the latter, and an inner-oblique similar streak below it; two submarginal very slender sullied brownish-whitish sinuous lines and a marginal regular line. *Hindwing* with a prominent white inner-discal band, a very slender medial-discal and an outer submarginal indistinct sullied brownish line, between which is a slightly more distinct inner submarginal slender lunulated line. Underside paler, with all the markings more defined. Female. Upperside as in male, with all the markings more prominent. Underside the same. Quite distinct from *Ilira* and *Omeroda*. Expanse, ♂ 2, ♀  $2\frac{1}{10}$  inches. Types in Coll. Rothschild. *Habitat*. Nias Island.—*Bimbisara Ilira* (Neptis Ilira, Kheil, Rhop. Nias, p. 24, pl. 3, fig. 13, 14, ♂ ♀ (1884). *Habitat*. Nias Island.—*Bimbisara Vikasi* (Neptis Vikasi, Horsfield, Catal. Lep. Mus. E. I. C. pl. 5, fig. 2, 2a, ♀ (1829). Standinger, Exot. Schmett. pl. 50. Male and female. Upperside dark olivescient fuliginous-brown. *Forewing* with a rather broad pale sullied brownish-white discoidal streak, distinctly indented at upper end of the cell; discal excurved series of spots broadly dentate, broadest in female; a very slender inner submarginal sinuous line, a middle lunular line, and then an outer marginal even line. *Hindwing* with a moderately broad inner-discal and a narrow outer-discal band, also a slender less defined submarginal line and an obscure medial-discal line. Underside pale brown, with prominent dark purplish-brown interspaces between the markings, as above, which are tinged with purpurescent-white. Expanse, ♂  $2\frac{1}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{1}{10}$  to  $2\frac{6}{10}$  inches. *Habitat*. Java.—*Bimbisara Celebica* (Neptis Celebica, Wallace, MS.). Female. Larger than Java *Vikasi*. Upperside with all the markings obscurely defined, the upper and lower portions of the discal curved macular band on forewing somewhat narrower,

on the hindwing the narrow medial-discal pale line is broader and the outer-discal band much broader. Underside with all the markings and bands broader than on upperside, those on the hindwing conspicuously broader, and all being browner than in *Vikasi*. Expanse,  $2\frac{9}{10}$  inches. Type in Hewitson Coll. British Museum. *Habitat*. Macassar.—*Bimbisara Palawanica* (Neptis Palawanica, Staudinger, Deuts. Ent. Zeit. 1889, p. 64). *Habitat*. Palawan.—*Bimbisara Nitetis* (Neptis Nitetis, Hewitson, Exot. Butt. iv. Nep. pl. 1, fig. 5, ♀ (1868). Semper, Reise Phil. Lep. p. 150, pl. 30, fig. 1—3, ♂ ♀. *Syn.* Neptis Vikasina, Staudinger, MS. *Habitat*. Mindanao, Philippines.—*Bimbisara Vibusa* (Neptis Vibusa, Semper, Reise Phil. Lep. p. 150, pl. 29, fig. 19, ♀). *Habitat*. S. Mindanao.

### Genus PANDASSANA.

*Pandassana*, Moore, Lep. Indica, iii. p. 146 (1898).

IMAGO.—Male. *Forewing* subtriangular, rather short; costa very slightly arched at the base, apex obtuse, exterior margin very slightly convex and almost even, posterior margin slightly recurved; first subcostal branch emitted at fully one-third before end of the cell, second at one-tenth before the end; first discocellular outwardly-oblique, second concave; cell open. *Hindwing* conically-ovate; anterior margin gently arched towards the end, apex obtuse, exterior margin very obliquely-convex, scalloped; precostal vein abruptly bent outward; subcostal branch emitted near to costal, radial at nearly twice the distance from base of subcostal branch. *Body* moderately slender; palpi very slender, finely hairy; antennal club stout; eyes naked.

TYPE.—*P. fuliginosa*.

### PANDASSANA FULIGINOSA.

*Dry-season brood* (Plate 293, fig. 1, 1a, b, c, ♂ ♀).

*Neptis fuliginosa*, Moore, Trans. Ent. Soc. 1881, p. 31. de Nicéville, Butt. of India, etc., ii. p. 90 (1886)—*Dry-season*.

*Neptis Thamala*, Moore, Journ. Linn. Soc. Zool. 1886, p. 36, pl. 3, fig. 1, ♀ —*Wet-season*.

IMAGO.—Male and female. Upperside dark fuliginous olive-brown. *Forewing* with a fuliginous ochreous-white entire discoidal streak, two very indistinctly defined spots situated between the bases of subcostal and lower radial veinlet, a transverse discal interrupted rather broad macular band, two slender submarginal lunular lines, and a less defined marginal line. *Hindwing* with a broad inner-discal and an outer-discal band, a less distinct slender intervening medial-discal line, and a similar outer marginal line. Underside paler fuliginous-brown, with markings as above, but more prominent and whiter, the subcostal vein of forewing basally,

being also whitish, the hindwing having also an additional subbasal band, a less defined shorter basal, and an additional outer marginal line. *Body* and palpi above brown, beneath and legs fuliginous-white; antennæ black, tip reddish beneath.

Expanse, ♂ 2, ♀  $2\frac{2}{10}$  inches.

*Wet-season brood* (Plate 293, fig. d, e, f, g, ♂ ♀).

Male and female. Upperside dark fuliginous olive-brown; markings slightly narrower than in *dry-season* brood. *Forewing* with a pale dusky brownish-ochreous entire discoidal streak, two small spots above end of the cell, two transverse discal curved macular bands, a submarginal narrower band, and a slender marginal line, the submarginal band with a large conical spot protruded between the radial and upper median. *Hindwing* with an inner-discal and an outer-discal slightly recurved brownish-ochreous band, between which is a slender paler band, and beyond is a similar submarginal band and a marginal line. Underside paler brown; markings as above, but of a yellowish-ochreous, the subcostal vein of forewing also ochreous, and the hindwing also with a subbasal and a short basal ochreous band.

Expanse, ♂  $1\frac{8}{10}$ , ♀  $2\frac{2}{10}$  inches.

HABITAT.—Lower Burma; Tenasserim; Sumatra; Borneo.

DISTRIBUTION.—The type specimen of *fuliginosa* was taken at Moulmain by Major C. H. E. Adamson, and the types of *Thamala* in Mergui, in February, and at Pilai in March, by Dr. J. Anderson, and are in the Indian Museum, Calcutta. A female of the dry-season form from the Donat Range, Upper Tenasserim, taken in October, is in Mr. de Nicéville's collection, who also records it from "N.E. Sumatra" (J. Bombay, N. H. Soc. 1895, 408). A specimen from Borneo is in the British Museum, and one in Mr. D. Cator's collection from N. Borneo.

Of our illustrations of this species on Plate 293, figs. 1, 1a, b, c, are from male and female types of *dry-season* form, and fig. 1, d, e, from those of the wet-season form, kindly sent to me for this purpose, from the Calcutta Museum, by Mr. L. de Nicéville.

MALAYAN SPECIES.—*Pandassana Cura* (Neptis Cura, Weymer, Stett. Ent. Zeit. 1885, p. 265, pl. 1, fig. 5. *Habitat.* Nias Island.—*Pandassana Monata* (Neptis Monata, Weijenbergh, Pet. Nouv. Entom. 1874, p. 408; Snellen, Tijds. voor Entom. 1897, p. 141, pl. 6, fig. 3, ♂. *Habitat.* Banka Island.—*Pandassana Ebusa* (Neptis Ebusa, Felder, Wien. Ent. Mon. 1863, p. 112 Reise Novara, Lep. 111, pl. 56, fig. 7 (1867). *Habitat.* Mindanao, Philippines.

MALAYAN ALLIED GENERA. Genus BISAPPA.—Male. *Forewing* rather elongated, subtriangular; costa very much arched from the base, apex obtuse, almost rounded, exterior margin oblique and nearly even, posterior margin much recurved; cell area



broad, open; first subcostal branch emitted at one-fifth, and second at a short distance before end of the cell; discocellulars extremely short and outwardly oblique; base of upper radial almost touching the subcostal; submedian vein much recurved. *Hindwing* somewhat narrow and elongate, ovate; anterior margin much arched, apex rounded, exterior margin very obliquely convex and very slightly scalloped, anal angle rounded, abdominal margin short; with a short basal costal glossy white band, a less glossed medially-disposed pale area extending from the costal vein to below the subcostals, and enclosing a distinctly-defined dull brown patch of scales between the bases of the subcostals; precostal vein abruptly curved; radial emitted from lower subcostal at nearly equal distance from base of the latter and the costal. *Body* slender; palpi extremely slender, apical joint long; compactly clothed with fine short hairs beneath; antennal club elongated; eyes naked. *Type*. B. Neriphus.—*Bisappa Neriphus* (Neptis Neriphus, Hewitson, Exot. Butt. iv. *Neptis*, pl. 1, fig. 6, 7 (1868). *Habitat*. Sula.—*Bisappa Nirvana* (Neptis Nirvana, Felder, Reise Novara, Lep. iii. p. 426 (1867). *Habitat*. Celebes.—*Bisappa Sangira* (Neptis Sangira, Standinger. *Habitat*. Great Sangir Island.

Genus MAROSIA.—Male. *Forewing* subtriangular; apex obtuse, exterior margin almost erect, posterior margin slightly recurved, first subcostal branch emitted at one-sixth before end of the cell, second at one-eighth beyond the cell; discocellulars short. *Hindwing* conically-ovate; anterior margin rather straight, apex obtuse, exterior margin very oblique and convex, slightly scalloped. Eyes naked. *Type*. M. Antara.—*Marosia Antara* (Neptis Antara, Moore, Proc. Zool. Soc. 1858, p. 4, pl. 49, fig. 2, ♀. *Habitat*. Celebes.—*Marosia Zenica* (Neptis Zenica, Swinhoe, Ann. Nat. Hist. 1897, p. 407. *Habitat*. Batchian.

Genus PALANDA.—Male. *Forewing* subtriangular; costa arched at the base, apex obtuse, exterior margin slightly convex, very slightly oblique, and even, posterior margin deeply recurved; first subcostal branch emitted at one-fifth before end of the cell, second close to the end; upper and middle discocellular very short; cell open; medians not widely apart. *Hindwing* narrowly triangularly-ovate; anterior margin long, very convex, apex obtuse, exterior margin very oblique, slightly convex and uneven, abdominal margin short; precostal vein abruptly bent outward; subcostal branch emitted very close to the costal, radial at four times the distance. *Body* slender; palpi very slender, very sparsely hairy, third joint long, pointed; eyes naked. *Type*. P. Illigera.—*Palanda Illigera* (Limenitis Illigera Eschscholtz, Kotzeb. Reise, iii. p. 212, pl. 8, fig. 17 (1821). *Athyma Illigera*, Moore, P. Z. S. 1858, p. 19, pl. 51, fig. 4. Semper Reis. Phil. Lep. p. 148, pl. 29, fig. 15, 8, ♂ ♀ (1889). *Syn*. Neptis Livilla, Wallengren, W. Ent. Mon. 1866, p. 36. *Habitat*. Luzon; Manilla.—*Palanda Illigerella* (Neptis Illigerella, Standinger, D.

Ent. Zeit. 1889, p. 64. *Habitat.* Palawan.—*Palanda Bella* (Neptis Bella Staudinger, *id.* p. 61. *Habitat.* Palawan.—*Palanda Eschscholtzia* (Neptis Eschscholtzia, Semper, Reisen Philip. Lep. p. 149 (1889). *Habitat.* Luzon.

### Genus STABROBATES.

*Stabrobates*, Moore, Lep. Indica, iii. p. 146 (1898).

*Neptis* (part), Auctorum.

*Neptis* (sect. 6), Felder, Neues Lep. p. 31 (1861).

IMAGO.—Male. *Forewing* elongated, subtriangular; apex rounded, exterior margin oblique, concave in the middle, almost even, posterior angle rounded, posterior margin much recurved; first subcostal branch emitted at one-third before end of the cell, second at one-ninth before the end; discocellulars outwardly oblique, both very short; cell open; middle and lower median very wide apart, lower median being emitted nearly opposite the first subcostal branch; submedian vein much recurved; posterior margin of the underside below the submedian vein glossy brownish-grey. *Hindwing* short, conically-triangular; anterior margin obliquely-convex beyond the middle, apex rounded, exterior margin obliquely convex and scalloped, anal angle obtuse; costal border glossy-grey, and a medially disposed unglossed patch from costal vein to lower subcostal; precostal vein rather long, bent outward before its middle; costal vein ending at one-fourth before the apex; radial and subcostal branch at equal distances from the costal vein. *Body* slender;\* palpi long, slender, densely clothed with wide spreading fine long hairs; antennal club slender; eyes naked. *Type*.—S. Radha.

### STABROBATES RADHA (Plate 294, fig. 1, 1a, b, c, ♂ ♀).

*Neptis Radha*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 166, pl. 4a, fig. 4, ♂ (1857); *id.* Proc. Zool. Soc. 1858, p. 6. de Nicéville, Butt. of India, etc., ii. p. 84 (1886).

*Neptis Asterastilis*, Oberthür, Etudes Entom. xv. p. 10, pl. 1, fig. 5, ♂ (1891).

IMAGO.—Male. Upperside brownish-black, with blacker intervening bordering spaces between the veins; markings yellowish-ochreous; cilia slightly alternated with white. *Forewing* with a prominent yellowish-ochreous elongated discoidal streak extending along lower half of the cell area to some distance above and below base of the upper median veinlet, the streak being slightly indented opposite the discocellulars; a very slender short streak divided by the second subcostal branch

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\* In *Stabrobates Viraja*, the male of the *dry-season* form possesses a conspicuous tuft of *laxly* exerted black (?glandular) scales of varied shapes, which is disposed laterally along the middle segments of the abdomen beneath. Not observable in specimens of *wet-season* form.

on costal margin, below which are two very indistinctly defined lunules; beyond which are three outwardly-oblique subapical spots, the upper being small, short, and divided by the third subcostal branch, the second broadly elongated, the third shorter and conical; below these are two large conjoined discal spots placed above and below the middle median veinlet, the upper one being narrow, the other broad and rounded; beneath these are two narrower conjoined inwardly-oblique spots ending on middle of posterior margin; beyond these is a transverse submarginal slightly-defined pale greyish-brown lunular line, its lower end being sometimes tinged with ochreous. *Hindwing* crossed by a rather broad yellowish-ochreous inner-discal band extending to the abdominal margin, and a narrower outer-discal lunular band, followed by a slightly-defined submarginal pale greyish-brown lunular line. Underside deep brownish-red, the ochreous markings as above, but paler and less defined. *Forewing* also with the lower discal interspaces suffused with black; the discoidal streak diffusely extending below the median vein; a curved violet-grey streak crossing upper end of the cell; two transverse violet-grey lunular fasciæ inwardly-bordering the subapical spots, and a broader similar outer-bordering fascia; the submarginal line also being mostly violet-grey. *Hindwing* also with a broad violet-grey basal fascia, subbasal streaks between the veins, two transverse medial discal sinuous fasciæ and two submarginal narrower sinuous fasciæ.

Female. Upperside as in male, the yellowish-ochreous markings somewhat broader and paler. Underside as in male. *Body* and palpi above brownish-black; abdomen above with a slightly-defined basal greyish band; palpi, thorax and legs beneath grey; legs above and abdomen beneath pale yellowish-ochreous; antennæ black, tip ochreous beneath.

Expanse, ♂  $2\frac{8}{10}$  to 3, ♀  $3\frac{4}{10}$  inches.

HABITAT.—Nepal; Sikkim; Bhotan; Cachar; Khasia Hills; Naga Hills; Upper Burma.

DISTRIBUTION.—“This is a rare species. Mr. Möller has obtained a single specimen in Sikkim in the spring. I took a worn male at about 4000 feet elevation below Darjiling, in October, and Mr. Wood-Mason obtained a single male on Nemotha Peak, Cachar, in September” (de Nicéville *l.c.* 85). “Probably occurs in Sikkim throughout the warm months. Mr. Dudgeon has taken it several times at 5000 feet elevation, and finds that it is extremely fond of pitching on the same bush for several consecutive days. Its elevation extends to 7000 and 8000 feet, and he doubts its occurrence below 3000 feet” (*id.* Sikkim Gazetteer, 1894, 136). Mr. H. J. Elwes says it is “a rare species in Sikkim, which I have never taken myself, but it occurs between April and December at low elevations.” (Tr. Ent. Soc. 1888, 343). Mr. Elwes records “a single male, very pale in colour, from Bernardmyo, Upper Burma, and others from the Naga Hills, taken by Mr. W. Doherty”

(P. Z. S. 1891, 274). An example of the male, very pale in colour (probably *dry-season* form), taken by Mr. Doherty in Upper Burma, has been figured and described as *N. asterastilis*, by Mons. Oberthur. We possess both sexes from the late General G. Ramsay's Nepal collection. Colonel C. Swinhoe has received several of both sexes from Shillong and the Khasia Hills.

**STABROBATES NARAYANA** (Plate 295, fig. 1, 1a, ♂).

*Neptis Narayana*, Moore, Proc. Zool. Soc. 1858, p. 6, pl. 49, fig. 3, ♂. de Nicéville, Butt. of India, etc., ii. p. 87 (1886).

IMAGO.—Male. Upperside olivescient fuliginous-black, with blacker intervening bordering patches between the veins; markings white or sullied ochreous-white; cilia alternated with white. *Forewing* with a white elongated discoidal streak extending along lower area of the cell to a short distance above and base of the upper median veinlet, the streak widely indented opposite the discocellulars; three very small slender streaks divided by the subcostals, beyond which are three subapical outwardly-oblique spots, the upper short and vein-divided, the second elongated, the third short and conically-triangular, below these are two discal larger conjoined spots placed above and below the middle median, the upper one being narrow, the lower somewhat broadly-quadrate; beneath these are two smaller inwardly-oblique conjoined spots; beyond is a transverse submarginal lunular line, the upper part of which is pale fuliginous, the lower whitish. *Hindwing* crossed by a broad sullied-white inner-discal band, and a narrower outer-discal lunular band, followed by a very indistinctly-defined pale submarginal lunular line. Underside dull brownish-red; the white markings as above, but less prominent, and violaceous-white. *Forewing* also with the costal base and upper cell area pale yellowish-ochreous, the lower discal interspaces fuliginous; outwardly bordering the subapical spots are violaceous-white lunules; the submarginal lunular line also partly violaceous-white. *Hindwing* also with the veins basally, and basal interspaces below the costal and subcostal, a medial discal zigzag line, and two submarginal slender lines violaceous-white.

Female. Upperside brighter olivescient-black; markings pale ochreous-white. Underside as in the male. *Body* and palpi above fuliginous-black; palpi and thorax beneath, and forelegs white; middle and hind legs and abdomen beneath pale ochreous.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{7}{10}$  inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—The type specimen, and a male and female, from Naini Tal,

Kumaon, at 6500 feet elevation, taken by Col. A. M. Lang in May, is in the British Museum; also a female in the Hewitson collection. We possess two males from the Western Himalayas. Mr. de Nicéville records it as having been "taken by Col. Lang at Naini Tal, rarely, at from 5500 to 6500 feet elevation, in the middle of May" (J. A. S. Beng. 1888, 276). The Indian Museum, Calcutta, possesses specimens of both sexes from the Kulu Valley, taken in May by Mr. A. Graham Young, and others from Kunawur are in Col. Lang's collection. Mrs. Deane took a single female at Chini in June" (de Nicéville, *l.c.* 88).

**STABROBATES NANA** (Plate 295, fig. 2, 2a, ♂).

*Neptis Nana*, de Nicéville, Journ. Asiatic Soc. Bengal, 1888, p. 276, pl. 13, fig. 1, ♂.

IMAGO.—Male. Upperside. Both wings distinguished from *N. Narayana* by having all the markings bright yellow-ochreous instead of white. *Forewing* with the submarginal band narrower. Underside; both wings with the ground-colour and pale violet markings of a deeper and richer shade of colour. *Hindwing* with the submarginal band as above, narrower, the pale violet band between it and the discal band broader and better defined, and the marginal pale violet line nearer the margin.

Expanse, ♂  $2\frac{5}{10}$  inches.

HABITAT.—Sikkim; Bhotan.

DISTRIBUTION.—"There are three males in the collection of Messrs. Otto Möller and A. V. Knyvett, taken in April and June by their native collectors in Bhotan" (de N. *l.c.* 276). A male from Darjiling, taken by Col. Lidderdale, is in the British Museum.

**STABROBATES MANASA** (Plate 295, fig. 3, 3a, ♂).

*Neptis Manasa*, Moore, Cat. Lep. Mus. E. I. Company, i. p. 165, pl. 4a, fig. 2, ♂ (1857); *id.* Proc. Zool. Soc. 1858, p. 5. de Nicéville, Butt. of India, etc., ii. p. 87 (1886).

IMAGO.—Male. Upperside dark fuliginous-brown; markings pale yellowish-white; cilia alternated with white. *Forewing* with an elongated entire discoidal streak, which is continuous with the discal spots, extending elongatedly between the upper medians and there joins the lower discal spot, below which are the two inwardly-oblique conjoined spots on the posterior margin; from the costa before the subapical spots are three minute pure white costal spots placed obliquely outward; an outwardly-oblique subapical streak composed of a minute costal streak, an elongated fusiform spot and a third short somewhat quadrate spot, below which

is a very obscure small pale brown dentate spot; a submarginal obscure pale brownish-white lunular line. *Hindwing* crossed by a broad inner-discal band, a narrow outer-discal somewhat quadro-lunular band, between which is a medial discal obscure pale brown slender lunular line, and beyond a submarginal line. Underside pale dull yellowish-ochreous; markings as above, less defined, all pure white, the submarginal lines, and the medial and outer-discal band on the hindwing being suffused with pale lilac. *Forewing* also with the discoidal streak, discal and lower spots continued in an uninterrupted curved series to the posterior margin, the lower discal interspace being slightly suffused with fuliginous-brown. *Hindwing* also with a series of small lilacine-white spots between the costal vein and discal band. *Body* and palpi above fuliginous-brown, beneath and forelegs greyish-white; middle and hind legs pale greyish-ochreous; antennæ black.

Expanse, ♂  $2\frac{7}{10}$  inches.

HABITAT.—N. India.

DISTRIBUTION.—The type specimen, now in the British Museum, is the only example of this species we have seen. It was presented to the late East India Museum by Col. Buckley, but in what locality it was taken is unknown.

**STABROBATES NYCTEUS** (Plate 295, fig. 4, 4a, ♂).

*Neptis Nycteus*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1890, p. 203, pl. D, fig. 7, ♂.

IMAGO.—Male. Upperside fuliginous-black; markings sullied white; cilia alternated with white. *Forewing* with a sullied-white somewhat fusiform elongated entire discoidal streak extending along lower area of the cell to beyond the base of upper median veinlet; above the middle of the streak, within the cell, is a very small slightly-defined whitish speckled spot; above the end of the streak are four small outwardly-oblique slender spots from the costa, divided by the subcostal veinlets; beyond are three subapical oblique spots, the upper small and narrow, the second much larger and its ends sullied with ochreous, the third being smaller and triangulate; below are two discal larger elongated conjoined spots, disposed between the medians, the upper one joining the lower end of the discoidal streak, both being disposed obliquely-outward; below these are two smaller narrow conjoined spots, disposed obliquely-inward on the posterior margin; beyond is a submarginal pale fuliginous-grey narrow lunular line. *Hindwing* crossed by a broad white inner-discal band, and a narrow submarginal anteriorly-attenuating fuliginous-white lunular band. Underside, ground-colour yellowish-ochreous, the white markings, as above, but somewhat broader, and their edges less sharply defined; the two series of subapical spots, and submarginal lunular band on both wings being distinctly

suffused with pale lilacine-grey; the discoidal streak, discal spots on the forewing, and discal band on hindwing, being pale yellowish-white. *Forewing* also with the upper discal and apical interspaces deep castaneous-red, the lower discal and submarginal interspaces blackish. *Hindwing* also with a subbasal lilacine-white broken streak below the costal vein; the discal white band bordered on both sides, and the submarginal lilacine-white lunular band inwardly bordered, with deep chestnut-red, the latter also outwardly bordered by pale chestnut-red.

Female. "Upperside. *Forewing* with the spot in the second median interspace very narrow, touching the second median veinlet, and well-separated from the discoidal streak, of exactly the same length as the spot below it, which latter is bounded above and below by the second and first median veinlets, the two spots together forming a perfect quadrangular oblong figure; other as in male. *Hindwing* with the discal band narrower than in male, the submarginal band wider and pure white instead of sullied. Underside, both wings very much paler than in the male, the castaneous bands almost obliterated, the ground-colour mostly very pale yellow." *Body* and palpi above fuliginous-black; beneath and legs greyish-white; antennæ black."

Expanse, ♂, ♀,  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—Sikkim.

DISTRIBUTION.—"The type male was taken in Sikkim in June by Mr. G. C. Dudgeon, and the female in July, and a female in Mr. A. V. Knyvett's collection were all taken at Tonglo on the Singalelah Range, at an elevation of about 12,000 feet" (de N. l.c. 204). A male, in Colonel Swinhoe's collection, was taken by a native collector at "Lachin Lachoong, 8000 to 16,000 feet elevation." Mr. H. J. Elwes took "a single male in the forest near the Rangbi Jhora, on the road to Serail, at 6000 feet, in June" (Tr. Ent. Soc. 1888, 344). Has also been taken by Mr. G. C. Dudgeon at 7000 feet elevation in Daling.

### STABROBATES ZAIDA.

*Neptis Zaida*, Doubleday and Hewitson, D. Lep. pl. 35, fig. 3; Westwood, *id.* p. 272 (1850). Moore, Proc. Zool. Soc. 1858, p. 6. de Nicéville, Butt. of India, etc., ii. p. 86 (1886).

*Dry-season brood* (Plate 296, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside fuliginous-black; markings pale ochreous-white, or very pale ochreous; cilia alternated with pale ochreous-white. *Forewing* with an elongated broad discoidal streak extending along lower area of the cell and ending in an acute point at some distance on the upper median veinlet, its upper edge entire and curved from the base, its apex below extending slightly within the basal inter-



space between the upper and middle medians; a subapical oblique-band composed of vein-divided spots, the upper on the costa being very slender, the other two broad, sometimes the lower extends over the lower radial; below is a large broad rounded or somewhat quadrate discal spot, disposed obliquely-inward and extending from half-way above the middle median to the lower median, and sometimes slightly over the latter veinlet, followed by a broad lower streak on the posterior margin; beyond is a slightly-defined submarginal pale line. *Hindwing* crossed by a broad inner-discal band and an outer-discal narrower somewhat lunulated band; a pale submarginal line also slightly apparent. Underside. Ground-colour pale yellowish-ochreous or pale reddish-ochreous; markings as above, but less prominent and whitish, the lower medial-discal interspace somewhat blackish; with the marginal line on both wings, and the outer-discal band on hindwing is tinted with lilacine-white. *Hindwing* also with a slightly-defined basal and subbasal pale yellowish-ochreous fascia, and a similar-coloured lunular fascia between the discal and outer band.

Female similar to male, with the markings somewhat broader.

*Body* and palpi above fuliginous-black; palpi beneath brown, but whitish at the sides; body beneath and legs pale yellowish-ochreous.

Expanse, ♂  $2\frac{7}{10}$ , ♀ 3 inches.

*Wet-season brood* (Plate 296, fig. 1d, e, ♂).

Upperside; ground-colour blacker than in dry-season; the discoidal streak and bands pale ochreous or pure ochreous. Underside; ground-colour reddish-ochreous or chestnut-red; all the markings pale ochreous, the subapical band and discal bands on hindwing washed with pale violet-pink.

Expanse, ♂  $2\frac{6}{10}$  inches.

HABITAT.—W. and E. Himalayas; ? Siam.

DISTRIBUTION.—“Specimens from Masuri, in Col. A. M. Lang’s collection, were taken in June at 7000 feet elevation, and others from Sikkim, in which the markings are almost pure white. In other Sikkim and Masuri examples the markings are pure ochreous, and there are intermediate specimens in the Indian Museum, Calcutta, taken by Mr. C. Templeton at Masuri” (de Nicéville, Butt. Ind. ii. 87). A male and female taken at Masuri in May, by S. Robson, is in Mr. W. Rothschild’s collection. Examples from Darjiling, taken by Mr. Lidderdale, are in the British Museum. “In Sikkim this rare and beautiful species is hardly ever taken by the native collectors now, but I found it not uncommon in June and July, in the forest above Rangbi at about 6000 feet elevation. The males fly about the tops of Oak trees in the rare gleams of sunshine, sitting on the leaves, but descend seldom

to the ground" (H. J. Elwes, Tr. Ent. Soc. 1888, 343). A male of the wet-season form, with pure ochreous markings, labelled "Siam," is in Mr. H. Grose-Smith's collection.

### STABROBATES ANANTA.

*Neptis Ananta*, Moore, Catal. Lep. Mus. East Ind. Company, i. p. 166, pl. 4, a, fig. 3 (1857); *id.* Proc. Zool. Soc. 1858, p. 5; Anderson's Zool. Res. Yunan Exp. p. 294 (1878). de Nicéville, Butt. of India, etc., ii. p. 85 (1886).

*Wet-season brood* (Plate 297, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside dark brownish-black; markings deep yellowish-ochreous; cilia slightly alternated with white. *Forewing* with an elongated narrow discoidal streak extending along lower area of the cell and ending in a point some distance on the upper median veinlet, the streak being very slightly angled below at the middle median, and its upper edge indented above the angle; a subapical oblique-series of three spots, the upper slender and divided by the third subcostal veinlet, the second elongate and obliquely indented on its outer edge, the third being short, broad and conical; these are joined by a more or less slightly-defined pale slender streak to a larger discal inwardly-oblique rounded spot cut by the middle median veinlet, below which is a narrower spot cut by the submedian on the posterior margin; beyond is a slender submarginal slightly-apparent pale brown line. *Hindwing* crossed by a slightly broader inner-discal band, and a narrower outer band, followed by a slightly-apparent pale brown submarginal line; a similar line also slightly apparent between the discal bands; on the costa towards the base is a broad glossy white patch, the base of subcostals also being lined with white. Underside. Ground-colour bright ochreous-red or chestnut-red. *Forewing* with the discoidal streak and discal spot pale yellowish-ochreous; the subapical spots, the spot on posterior margin, and two submarginal broken lines, and the end of discoidal streak bluish-grey; lower discal interspaces slightly fuliginous-black. *Hindwing* with the inner-discal band pale bluish greyish-white; the outer-discal band, submarginal line, medial-discal sinuous line, and a broad basal costal band bluish-grey; the veins also lined with bluish-grey. *Body* and palpi above black; body and palpi beneath, forelegs, middle and hind femora bluish-grey; middle and hind tibiæ and tarsi pale ochreous; antennæ black.

Female. Upperside. Ground-colour paler fuliginous-black; markings as in male, but somewhat broader and paler. Underside also somewhat paler; markings as in male.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{6}{10}$  to  $2\frac{8}{10}$  inches.

*Dry-season brood* (Plate 297, fig. 1, d, e, f, g, ♂ ♀).

Male. Upperside paler brownish-black than in *wet-season* brood; markings somewhat broader and of a paler yellowish-ochreous. Underside. Ground-colour paler ochreous-red; all the markings less prominent.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—W. and E. Himalayas; Assam; Silhet; Khasia and Naga Hills; Burma; Malay Peninsula.

DISTRIBUTION.—This is rather a rare insect. Mr. de Nicéville “took it in the N.W. Himalayas at Kujiah near Dalhousie, and at Ulwas, Chumba, in wooded streams at the end of May. Mr. A. G. Young has taken it in Kulu at the same period, and Col. A. M. Lang took it at Kandloo in Kunawur, in July. Mr. C. Templeton took it at Masuri, Mr. J. L. Sherwill at Hulunguri in the Jorehat District of Assam in March, April, and June, and Mr. A. V. Knyvett has taken it in Sikkim and Bhotan” (Butt. Ind. ii. 86). Specimens from Sultanpur, Kulu, are in Mr. J. H. Leech’s collection. The Rev. J. H. Hocking records it as “very rare in Kulu” (P. Z. S. 1882, 241). Mr. W. Doherty took it in Ramganga Valley, Kumaon, at 2500 feet; rare” (J. A. S. Beng. 1886, 125). We possess specimens from Nepal taken by the late General G. Ramsay, a female from Ruttun Pir, Kashmir, taken by Capt. Bayne Reed; from Bhotan, taken by Mr. G. C. Dudgeon; and a male from the Khasias. Mr. de Nicéville records it as “very local in Sikkim, where I have never seen it on the wing. Mr. Elwes says it is found in the forests at 5000 to 6000 feet and at lower levels. He took it on the road to Pashok above Lopchu, in June. It is very common at 4000 feet and upwards in Daling” (Sikkim Gazetteer, 1894, 136). Mr. W. Doherty obtained it in the Naga Hills, and also in the Karen Hills, Burma, from 4000 to 6000 feet (P. Z. S. 1891, 274). Colonel C. Swinhoe has received several specimens from the Khasia Hills. We possess a male from the Upper Mekong, Shan States, Burma, taken by Mr. R. Roberts, C.E. A male from Perak, Malay Peninsula, is in Mr. W. Rothschild’s collection.

#### STABROBATES VIRAJA.

*Neptis Viraja*, Moore, Proc. Zool. Soc. 1872, p. 563, pl. 32, fig. 6, ♂. de Nicéville, Butt. of India, etc., ii. p. 86 (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 351 (*larva*); *id.* 1896, p. 251, pl. 2, fig. 3 (*larva* and *pupa*).

*Wet-season brood.*

IMAGO.—Male and female. Upperside brownish-black; markings broad and deep yellowish-ochreous; cilia slightly alternated with white. *Forewing* with an

elongated broad entire discoidal streak, which is somewhat claviform in shape, and its lower end extending slightly for some distance below base of the upper median veinlet, and its upper edge very slightly indented at end of the cell; a subapical broad outwardly-oblique band, and an inwardly-oblique lower continuous broad band extending to the posterior margin; beyond which are two submarginal slightly-defined sinuous greyish-ochreous incomplete lines. *Hindwing* crossed by a broad inner-discal band, and an outer band, followed by a slightly-defined greyish-ochreous outer marginal line. Underside brownish-ochreous, with dusky-brown intervening discal spaces between the veins; discoidal streak and bands, as above, pale glossy virescent ochreous-white, their inner edges being suffused with pale ochreous. *Forewing* also with the inner marginal line entire and virescent-grey, the outer line less defined. *Hindwing* also with a short basal and a less-defined subbasal fascia, a medial-discal slender sinuous line, and the marginal line virescent-grey.

Female. Upperside as in male; markings the same. Underside darker and brighter brownish-ochreous than in male, with all the markings more prominent. *Body* and palpi above brownish-black; palpi and thorax beneath, and forelegs pale grey; middle and hind-legs, and abdomen beneath pale greyish-ochreous; antennæ black, tip reddish.

Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

*Dry-season brood* (Plate 298, fig. 1, larva and pupa; 1, a, b, c, d, ♂ ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat broader than in *wet-season* brood, the marginal lines on forewing yellowish-ochreous. Underside with the ground-colour paler brownish-ochreous than in *wet-season*, the cell-streak and discal bands broader, as above, but less defined. Male with a conspicuous tuft of laxly exerted black glandular scales of varied lengthened clavate shapes, disposed laterally along middle segments of abdomen beneath. This tuft was not observable in males of *wet-season* form that we examined.

Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{6}{10}$  inches.

CATERPILLAR.—“Resembles that of *R. Hordonia* in form, but the head is bifid at the top, and the dorsal points are wanting, while the last segment is produced into a single blunt point. The colour is dark greenish-brown, the fore-part, as in *R. Hordonia*, being much darker than the rest, but bordered with pale grey” (Davidson and Aitken, *l.c.* 251).

CHRYSLIS.—“Like that of *R. Hordonia*, but rather broader, and the wing-cases more evenly expanded” (*id.* 251).

HABITAT.—Sikkim; Bhotan; E. Bengal; Orissa; S. India; Burma; Upper Tenasserim.

DISTRIBUTION.—This is a rare species. Mr. de Nicéville “took a single female in the Sikkim Terai in October, and Mr. Otto Möller has one specimen also from Sikkim, taken in May. The Indian Museum, Calcutta, has examples from Buxa, Bhotan, a male taken by Mr. W. C. Taylor in Orissa, in March, another from the Wynaad, S. India, taken by Mr. Rhodes-Morgan, and a third from Cannanore. Major Marshall has a single female, taken in the Thoungyeen forests, Upper Tenasserim, in March. The four latter specimens differing from Himalayan females in having the submarginal band on upperside of hindwing nearly as broad as the discal band” (Butt. Ind. ii. 86). “Very rare in Sikkim, occurs in the Terai and low Valleys, probably throughout the summer” (*id.* Sikkim Gaz. 1894, 136). Colonel C. Swinhoe has examples of both sexes from Kavar, S. India, and from Shillong, Khasia Hills. Mr. G. F. Hampson records “one specimen taken on the Western Slopes of the Nilgiris at 500 feet, in October” (J. A. S. Beng. 1888, 352). Mr. H. S. Ferguson found it “rare in Travancore, two specimens being taken near Trevandrum in July” (J. Bombay N. H. Soc. 1891, 8). Capt. E. Y. Watson took “two specimens at Kathlekan, Mysore, in November” (*id.* 1890, 4). According to Messrs. Davidson and Aitken, it is not very common in the N. Kanara District, Bombay, but appears to be generally distributed” (*id.* 1896, 251). Col. C. H. E. Adamson records it as very uncommon at Bhamo, Upper Burma (List, 1897, 20). Capt. E. Y. Watson obtained three specimens at Tilin, in March and April, during the Chin-Lushai Expedition of 1889-90 (J. Bombay N. H. S. 1891, 38). A male from Naga Hills, and a female of the dry-season brood, from Atarum, Upper Tenasserim, taken by Capt. C. T. Bingham in March, is in Mr. W. Rothschild’s collection.

HABITS AND FOOD-PLANT OF LARVA.—“The larva of *Viraja* was discovered by Mr. T. R. Bell, in the Kanara District of Bombay. It feeds on the Blackwood tree, *Dalbergia latifolia*, and also on *D. racemosa*, and has similar habits to that of *R. Hordonia*, cutting through a leaf-stalk in such a way that all the leaflets beyond the cut part hang over; then it cuts off each leaflet of the pendant part, joins it to the stem with silk, and lives in the house of dead leaves thus formed, *feeding on the dead leaves*” (Davidson and Aitken, J. Bombay Nat. Hist. Soc. 1896, 251, 351).

NOTE.—This species, *S. Viraja*, is probably mimicked by the females of *Pantaporia Inara* and of *P. Selenophora*.

#### STABROBATES MIAH.

*Neptis Miah*, Moore, Catal. Lep. Mus. E. Ind. Company, i. p. 164, pl. 4a, fig. 1, ♂ (1857); Proc. Zool. Soc. 1858, p. 4. de Nicéville, Butt. of India, etc., ii. p. 85 (1886).

*Wet-season brood* (Plate 299, fig. 1, 1a, b, ♂ ♀).

IMAGO.—Male. Upperside dark purpurescent-black; markings deep yellowish-ochreous; cilia slightly alternated with greyish-white. *Forewing* with an elongated discoidal streak extending along lower half of the cell and ending in a more or less obtuse point half-way along the upper median veinlet, its upper edge indented at end of cell; a transverse curved discal almost complete macular band, composed of outwardly-oblique subapical, discal, and lower spots, the subapical being joined to the discal by a slender more or less complete streak, and the discal joined to the lower spot; followed by a submarginal slender pale greyish-brown or ochreous-brown line. *Hindwing* crossed by a moderately broad inner-discal band and a narrow outer band, between which is a slightly-defined pale greyish-brown fascia, and beyond by a similar submarginal line; on the costa is a broad basal glossy brownish-grey patch. Underside deep purplish-red; markings, as above, pinkish-white, the cell-streak and discal band of forewing having their edges inwardly suffused with ochreous. *Forewing* also with the submarginal line and an inner sinuous line purplish-grey. *Hindwing* also with a short basal fascia, a less-defined subbasal fascia radiating along base of the veins, a medial discal sinuous band, inner edges of the outer-discal band, and the submarginal line, all being purplish-grey.

Female. Upperside as in male, with the markings somewhat broader and paler. Underside as in the male. *Body* and palpi above black; palpi and thorax beneath, and forelegs greyish; abdomen beneath and hind-legs pale greyish-ochreous; antennæ black.

Expanse, ♂ 2 to  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

*Dry-season brood* (Plate 299, fig. 1, c, d, e, ♂ ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat broader than in wet-season form; the submarginal line more distinctly ochreous.

Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—Sikkim; Bhotan; Assam; Khasia and Naga Hills.

DISTRIBUTION.—“This is a fairly common species in Sikkim throughout the summer, and I have taken numerous males in October, sucking up the moisture from damp sand in the beds of streams. Mr. J. L. Sherwill took a male at Hulunguri in the Jorehat District, Assam, in March” (de Nicéville, *l.c.* 95). “Not uncommon in Sikkim by the river sides at from 1000 to 3000 feet elevation, from April to October” (H. J. Elwes, *Tr. Ent. Soc.* 1888, 343). Colonel C. Swinhoe

records it as "very common in the Khasia Hills" (Tr. Ent. Soc. 1893, 279). A specimen from the Naga Hills is in Mr. W. Rothschild's collection.

**STABROBATES NOLANA.**

*Neptis Nolana*, Druce, Proc. Zool. Soc. 1874, p. 105, ♀.

*Dry-season brood* (Plate 298, fig. 2, 2a, ♂ ♀).

Male and female. Upperside purpurescent-black; markings deep yellowish-ochreous. *Forewing* with the discoidal streak comparatively broader than in *Miah*, the subapical and lower discal band much broader, the upper part of the latter portion larger and more quadrately-angular, the slender marginal line distinctly ochreous. *Hindwing* with much broader discal and outer band, outer marginal line distinctly ochreous. Underside dull deep chestnut-red; markings broad as above; cell-streak and discal band on forewing virescent-white, slightly washed with pale ochreous in male and more so in female; bands on hindwing virescent-white, the medial discal fascia, outer marginal line and basal streak bluish-grey.

Expanse, ♂  $1\frac{8}{10}$ , ♀ 2 inches.

*Wet-season brood.*

Upperside; ground-colour blacker; bands deeper yellowish-ochreous, somewhat narrower, but still broader than in *Miah*; marginal line less defined. Underside; ground-colour rich purpurescent chestnut-red; markings narrower, as above, the bands sharper defined and more deeply coloured.

Expanse, ♂  $1\frac{8}{10}$  inch.

HABITAT.—Burma; Siam; Malay Peninsula.

DISTRIBUTION.—The type specimen, now in the British Museum, is recorded from Chentaboon, Siam. Specimens of the dry and wet-season form from Tilin Yaw taken in March, October, and November by Capt. E. Y. Watson, and a male from Thoungyeen, Burma, are also in the British Museum. A male from Muong Gnow, Shan States, Burma, is in Mr. W. Rothschild's collection; a single specimen was taken by Col. C. H. E. Adamson at Tounggya, Sekkan, Tenasserim, in February (List, 1897, p. 20).

Of our illustrations on Plate 298, fig. 2 is from a Burmese male, and fig. 2a from the type female of the dry-season form.

MALAYAN AND CHINESE SPECIES.—*Stabrobates Batara* (*Neptis Batara*, Moore, Trans. Ent. Soc. 1881, p. 310. N. *Miah*, Distant, Rhop. Malay. p. 444, pl. 41, fig. 14, ♂. *Habitat*. Malay Peninsula, Sumatra.—*Stabrobates Javanica*. Nearest

to *Batara*. Male. Wings somewhat shorter. *Forewing* with broader discoidal streak and discal band, the lower end of the discoidal streak extending slightly below the upper median, its end also less prolonged, the subapical and lower portions of the discal band slightly joined; a submarginal very slender ochreous line. *Hindwing* with a broader inner-discal band and narrower outer band, both also broader than in *Batara*. Underside; ground-colour rich ochreous-brown; the discoidal streak, and discal bands, as above, broader than in *Batara*, all being yellowish-ochreous; the submarginal band on both wings, and the slender sinuous medial-discal line on the hindwing being slightly washed with violet-grey. Expanse, ♂  $1\frac{8}{10}$  inch. Type in Coll. Hewitson, Brit. Mus. *Habitat*. Java.—*Stabrobates Disopa* (Neptis Disopa, Swinhoe, Ann. Nat. Hist. 1893, p. 256. *Syn*. N. Miah, Leech, Butt. of China, p. 198, pl. 19, fig. 3 (1893). *Habitat*. W. China.—*Stabrobates Chinensis* (Neptis Chinensis, Leech, Butt. of China, p. 198, pl. 19, fig. 2 (1893). *Habitat*. W. China.—*Stabrobates Thestias* (N. Thestias, Leech, *l.c.* p. 196, pl. 18, fig. 3, ♂ (1893). *Habitat*. W. China.—*Stabrobates Aspasia* (N. Aspasia, Leech, Entom. 1890, p. 37; Butt. of China, p. 193, pl. 18, fig. 5, ♂). *Habitat*. W. China.—*Stabrobates Antigone* (N. Antigone, Leech, *l.c.* p. 192, pl. 18, fig. 6, ♀. *Habitat*. W. China.—*Stabrobates Arachne* (N. Arachne, Leech, *l.c.* p. 191, pl. 18, fig. 7, ♂. *Syn*. N. Giddeneme, Oberthür, Et. Ent. 1891, p. 9, pl. 1, fig. 7. *Habitat*. W. China.—*Stabrobates Thetis* (N. Thetis, Leech, *l.c.* p. 191, pl. 18, fig. 10, ♂. *Habitat*. W. China.—*Stabrobates Armandia* (N. Armandia, Oberthür, Etud. Ent. 1876, p. 23, pl. 4, fig. 4, a, ♂. Leech, *l.c.* p. 195. *Habitat*. W.C. China.—*Stabrobates Themis* (N. Themis, Leech, *l.c.* p. 191, pl. 18, fig. 8, ♀). *Habitat*. W.C. China.—*Stabrobates Thisbe* (N. Thisbe, Ménétr. Schrenck's Reis. Amur. ii. p. 26, pl. 2, fig. 9 (1859). *Habitat*. Amurland.—*Stabrobates Beroe* (N. Beroe, Leech, *l.c.* p. 193, pl. 18, fig. 9, ♂. *Habitat*. C. China.—*Stabrobates Hesione* (N. Hesione, Leech, *l.c.* p. 194, pl. 18, fig. 1. *Habitat*. W.C. China.—*Stabrobates Antilope* (N. Antilope, Leech, *l.c.* p. 197, pl. 18, fig. 2, ♂. *Habitat*. W.C. China.—*Stabrobates Cydippe* (N. Cydippe, Leech, *l.c.* p. 196, pl. 18, fig. 4, ♂. *Habitat*. W. China.

PHILIPPINE ALLIED GENUS.—GENUS TAGATSIA.—Wings small. *Forewing* narrow, subtriangular; first subcostal branch emitted at one-eighth before end of the cell, second at one-fourth beyond the end of the cell; the cell open. *Hindwing* rather short, conically-ovate; exterior margin obliquely convex, even, anal angle rounded; precostal vein short, slightly bent outward; second subcostal and radial at equal distances from the costal. *Body* moderately slender; palpi shorter than in *Rakinda*, apical joint also shorter and stouter; eyes naked. *Type*. T. Dama.—*Tagatsia Dama* (Athyma Dama, Moore, P. Z. S. 1858, p. 19, pl. 51, fig. 5). Neptis Dama, Semper, Reis. Phil. Lep. p. 152, pl. 30, fig. 17, 18, ♂ ♀ (1889). *Habitat*. Manilla; Luzon.—*Tagatsia Gyrilla* (Neptis



Cyrilla, Felder, Wien. Ent. Mon. 1863, p. 114. Semper, *l.c.* p. 152, pl. 30, fig. 7, 8, ♂ ♀ (1889). *Syn.* *N. fervescens*, Butler, Tr. Ent. Soc. 1874, p. 427. *Habitat.* Luzon.—*Tagatsia Vidua* (Neptis Vidua, Staudinger, D. Ent. Zeit. 1889, p. 64. *Habitat.* Palawan.—*Tagatsia Athenais* (Neptis Athenais, Felder, Wien. Ent. Mon. 1863, p. 115. Semper, *l.c.* p. 152, pl. 30, fig. 9, 10, ♂ ♀ (1889). *Habitat.* Mindanao.—*Tagatsia Mysia* (Neptis Mysia, Feld. Wien. Ent. Mon. 1860, p. 247. *Habitat.* Batchian.—*Tagatsia Phrygia* (Neptis Phrygia, Feld. W. Ent. Mon. 1863, p. 115). *Habitat.* Mindoro.—*Tagatsia Attica* (Neptis Attica, Semper, Reis. Phil. Lep. p. 143, pl. 30, fig. 11, 12, ♂ ♀ (1889). *Habitat.* Mindanao.—*Tagatsia Athene* (Neptis Athene, Staudinger, D. Ent. Zeit. 1889, p. 62. Semper, *l.c.* p. 153, pl. 30, fig. 13, 14, ♂ ♀. *Habitat.* Palawan; Phil. Isles.

### Genus RAHINDA.

*Rahinda*, Moore, Lep. of Ceylon, i. p. 56 (1881).

*Pantoporia* (part), Hübner, Verz, Schmett. p. 44 (1816).

*Neptis* (part), Auctorum.

*Neptis* (sect. 7, part), Felder, Neues Lep. p. 31 (1861).

IMAGO.—Male. Wing small. *Forewing* subtriangular, rather narrow, apex obtusely pointed, exterior margin slightly convex and slightly scalloped; posterior margin long, much recurved; first subcostal branch emitted at one-fifth before end of the cell; second at about one-fourth beyond end of the cell; discocellulars both short, outwardly oblique, second slightly concave; cell open; base of posterior margin of the underside broadly glossy silvery-grey, and enclosing an elongated patch of brown glandular scales above the submedian vein. *Hindwing* rather narrow, somewhat elongate, ovate; anterior margin arched in the middle, apex rounded, exterior margin very oblique and convex, slightly scalloped; precostal vein short, slightly bent outward at tip; subcostal branch and radial emitted at some distance equally apart from the costal; costal vein ending at about one-third before the apex; with a broad glossy silvery-grey costal border, extending in the *dry-season* form to below the second subcostal, and isolating a conspicuous unglossed elongate (? glandular) patch of brown scales situated between the bases of subcostals; this patch, in the *wet-season* form pervading the interspace below the second subcostal veinlet. *Body* slender; palpi rather slender, laxly clothed with fine hairs, third joint long; antennæ slender, with a rather stout club; eyes naked. *Type.* R. Hordonia.

CATERPILLAR.—Head bifid at vertex. *Body* armed with two subdorsal forward-directed fleshy-pointed spines on the third and fourth segments and two hindward-directed similar spines on the sixth and twelfth segments.

CHRYsalis.—Head-piece obtusely pointed in front, thorax rounded, anterio-dorsum arched.

HABITS OF IMAGO.—Under reference to *R. Hordonia*, Mr. J. Beetham (Journ. Bombay N. H. Soc. 1890, 280) says, "The flight of the butterflies of this genus is peculiar. They seem to float and sail along, so that when on a level with the eye they disappear and re-appear; when settled on leaves as is their habit, they rest with wide expanded wings."

HABITS AND FOOD-PLANTS OF LARVA.—According to the observations made by Mr. J. Davidson and E. H. Aitken in the N. Kanara District, Bombay, "The larva may be found on several species of *Acacia*, and has the curious habit of feeding by preference, not on green leaves, but on those which it has caused to wither. The trees on which it feeds have all bi-pinnate leaves with minute leaflets. It bites through one or two pinnæ, which immediately droop and dry up, but are kept from falling by a few threads of silk with which the larva has taken the precaution to attach them to the central leaf-stalk. Thenceforth it lives among them and feeds entirely on them. The fore and underparts of the larva is of a dark greenish-brown, the rest is just that shade of greenish-grey which the leaves assume when withered, and is crossed by diagonal dark bands exactly representing the spaces between the leaflets—a most perfect disguise."

#### RAHINDA HORDONIA.

*Papilio Hordonia*, Stoll, Cramer's Pap. Exot. v. pl. 33, fig. 4, 4, D. (1791)—*Wet-season*.

*Nymphalis Hordonia*, Godart, Encycl. Méth. ix. p. 429 (1823).

*Neptis Hordonia*, Westwood, Doubleday and Hewitson, D. Lep. p. 271 (1851). Moore, Catal. Lep.

Mus. E. I. Company, i. p. 164 (1857); Proc. Zool. Soc. 1858, p. 4. Distant, Rhop. Malayana, p. 150, pl. 17, fig. 13, ♂ (1883). de Nicéville, Butt. of India, etc., ii. p. 78 (1886).

*Neptis plagiosa*, Moore, Proc. Zool. Soc. 1878, p. 830—*Dry-season*.

*Wet-season brood* (Plate 300, fig. 1, larva and pupa; 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside rich dark olivescient reddish-brown; cilia slightly alternated with white. *Forewing* with a reddish-ochreous discoidal streak occupying the lower half of the cell and extending broadly beyond it to middle of the disc above and below the upper median veinlet, being also distinctly indented above opposite the discocellulars and less so at a short distance inward; a transverse discal excurved broken band composed of a sinuously formed subapical portion and a more regular lower portion; followed by an inner submarginal obscure grey undulated line, a more or less-defined darker orange-red slender middle submarginal line, and then by an outer marginal obscure grey line. *Hindwing* with a reddish-ochreous broad inner-discal band, its outer edge curving upward towards the costa,

and a very narrow outer-discal curved band, followed by a submarginal very obscurely defined greyish-bordered black line; costal border glossy silvery-grey, with an elongated dull grey subcostal patch of unglossed brown scales below it. Underside mottled with dark chestnut-red, and more or less profusely studded with violaceous-grey strigæ between the markings; the discoidal streak, and discal bands on both wings, as on upperside, being yellowish-ochreous, but with much less defined edges; the two submarginal lines on forewing are more lunular, both being yellow anteriorly and violaceous-grey posteriorly; the submarginal lines on hindwing also violaceous-grey; the grey strigæ between the discal bands on the hindwing form a more or less well-defined sinuous fascia; posterior border of forewing basally glossy silvery-grey, enclosing an elongate patch of brown scales above the submedian vein.

Female. Upperside. Markings as in male, but somewhat broader; the submarginal red line more distinct, the discoidal streak extending slightly but obscurely below the median vein. Underside as in the male. *Body* and palpi above dark olivescens-brown, middle of thorax iridescent golden-green; tegulæ and abdomen densely speckled with reddish-ochreous scales in the male, less speckled in the female; palpi and thorax beneath, forelegs and hind femora pale-greyish; abdomen beneath, middle and hind tibiæ and tarsi pale-ochreous; antennæ above black, beneath greyish, tip of club ochreous-red.

Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{2}{10}$ , ♀  $1\frac{1}{10}$  to 2 inches.

*Dry-season brood* (Plate 300, fig. 1, d, e, f, ♂ ♀).

Male and female. Upperside with the reddish-ochreous markings broader than in *wet-season* brood, the cell-streak extending below the median vein; both the submarginal and the outer line on forewing generally reddish-ochreous, and on the hindwing, both these lines are also generally more or less obscurely of the same colour; in the male the subcostal patch of brown scales isolated between the bases of the subcostal veinlets. Underside as in *wet-season*, the markings, as above, less defined, those on the forewing being partially sprinkled and those on the hindwing sprinkled throughout, with reddish-ochreous strigæ, the violaceous-grey strigæ being disposed similarly but generally more dense than in *wet-season* examples; the glossy posterior border and its patch of brown scales on forewing of male, prominent.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

CATERPILLAR.—Head furcate; third, fourth, sixth, and twelfth segments each armed with two subdorsal long spine-like processes. Colour above greenish-grey, underparts greenish-brown, divided by a sublateral pale streak extending from anal segment to spine on fourth segment; a dorsal diagonal brown band on eighth to eleventh segment.

CHRYsalis.—Greenish-grey ; thorax and antero-dorsum slightly arched ; head-piece obtusely pointed in front. (Described from Davidson's figures.)

HABITAT.—W. and E. Himalayas ; Continental India ; Assam ; Silhet ; Burma ; Tenasserim ; Siam ; Malay Peninsula, etc.

DRY-SEASON VARIETY.—Occasionally a variety of the male of the dry-season form occurs in which the markings of the upperside are much paler yellowish-ochreous, the discoidal streak and discal bands on both wings are very broad and less defined, the lower end of the discoidal streak being confluent between the medians with the lower discal band ; in one example the subapical band covers the entire apex and is also confluent with the lower band ; the intervening ground-colour is thus much restricted and is of an obscure brownish-black. On the underside the ground-colour is much paler, the bands and strigæ indistinctly defined. An example of this variety, from Maungbhoom, Bengal, is in our possession ; one from Ooty, Nilgiris, in Colonel Swinhoe's collection, and one from Sikkim, taken in March, by Otto Möller, in Mr. W. Rothschild's collection.

DISTRIBUTION.—Mr. W. Doherty records taking it in Kumaon, at Ranibagh, the Terai, and the Ramganga, Kali, and Gorra Valleys ; common at from 1000 to 4000 feet elevation (J. A. Soc. Bengal, 1886, 125). We possess specimens of the wet-season form from Sikkim and Bhotan, taken by Mr. G. C. Dudgeon, and of the dry-season form, males from Nepal, taken by the late General G. Ramsay ; Sikkim, taken in March, a male variety from Maungbhoom, Bengal, a female from Calcutta, both sexes from Kanara, Malabar, and from the Nilgiris, also from Moulmain, Tounghoo, Burma, and a female from Yemma Choung, taken in February by Colonel C. H. E. Adamson. Mr. L. de Nicéville records the wet-season form from N.E. and S. India, and the dry-season form from Sikkim, Assam, Silhet, Malda, Orissa, Gangam, Nilgiris and Trevandrum, also from Chittagong and Upper Tenasserim. The dry form (*plagiosa*) taken in Sikkim in December, and typical *Hordonia* and intermediate forms from the spring to the autumn ; typical *plagiosa* taken in Calcutta in February only ; in Orissa, Mr. W. C. Taylor has taken *plagiosa* in February and March, and Mr. J. L. Sherwill in the Jorehat District, Assam, in March" (Butt. Ind. 79). "In Sikkim, it is a common species throughout the year, at low elevations. It is seasonally dimorphic, true *Hordonia* being the rains form, *plagiosa* occurring in the dry-season" (de Nicéville, Sikkim Gaz. 1894, 136). Lieut. E. Y. Watson, during the Chin-Lushai Expedition, obtained typical *Hordonia* at Pauk from September to December, and single specimens in February and March. Specimens transitional to *plagiosa* at Pauk and Tilin in November, and at Tilin from December to April. *Plagiosa* being taken at Tilin in March and April, and a single specimen in January" (J. Bombay N. H. S. 1891, 37). The type specimens of *plagiosa* were

taken in the cold weather on the road from Naththoung to Paboga in Upper Tenasserim. Dr. J. Anderson took it in Mergui in December. Colonel C. H. E. Adamson records it as "very abundant throughout Burma during the rainy and dry seasons" (List, 1897, p. 19). Mr. H. Druce records it from "Chentaboon, Siam" (P. Z. S. 1874, 105). "In the N. Kanara District, Bombay, this species is very common in all the more open wooded or scrubby parts during the latter half of the rainy season and throughout the dry months. During June and July it is rarely seen. The larva may be found on several species of *Acacia*, and has the curious habit of feeding by preference, not on green leaves, but on those which it has caused to wither" (J. Davidson, J. Bombay N. H. S. 1896, 250). Mr. H. S. Ferguson records it from "Travancore, the wet-season form being much commoner than the dry-season" (J. Bombay N. H. S. 1891, 8). Lieut. E. Y. Watson took it at "Kathlekan, Mysore, in November and December" (*id.* 1890, 4). It also occurs in the Malay Peninsula; Sumatra; Java; Borneo.

**RAHINDA SINUATA** (Pate 301, fig. 1, 1a, ♂ ♀).

*Neptis Sinuata*, Moore, Proc. Zool. Soc. 1879, p. 136. de Nicéville, Butt. of India, etc., ii. p. 79 (1886).

*Rahinda Sinuata*, Moore, Lep. of Ceylon, i. p. 56, pl. 28, fig. 3, 3a (1881).

IMAGO.—Male and female. Upperside. Differs from typical *Hordonia* in the discoidal streak being more irregularly bordered, both portions of the discal band narrower and very sinuously edged, the marginal red lines prominent. On the hindwing the lower edge of the discal band is distinctly sinuous, and the narrow outer band is also sinuous edged. Underside similarly marked as in *Hordonia*, the strigæ being less prominent and disposed in more irregular patches.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Ceylon.

DISTRIBUTION.—"Principally a low country insect, difficult to capture perfect as it always frequents the vicinity of thick thorny *Acacias*. Found at all times, but mostly in March and April" (Mackwood). "Found in the Western and Central Province; commonest in the Plains, but found up to 300 feet in forest land, at all times. Habits shy, flutters about bushes, alighting on the leaves with wings expanded" (Hutchison).

**RAHINDA CNACALIS.**

*Neptis Cnacalis*, Hewitson, Ann. and Mag. Nat. Hist. 1874, p. 357. de Nicéville, Butt. of India, etc., ii. p. 78 (1886).

*Wet-season brood* (Plate 301, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich dark olivescient reddish-brown; cilia

alternated with white. *Forewing* with a moderately narrow reddish-ochreous discoidal streak extending along lower half of the cell to the middle of the disc above and below the upper median veinlet, being distinctly indented opposite the discocellular and less so at a short distance inward; a discal transverse moderately narrow excurved interrupted macular band, followed by a slender submarginal black-bordered violet-grey line which is undulated in the male and sinuous in the female, and by an outer marginal less-defined straighter line. *Hindwing* crossed by a prominent broad whitish inner-discal band, which is more or less tinged with ochreous, and a very obscurely-defined trace of a slender reddish-brown outer-discal line, which is more apparent in the female, followed by an obscure submarginal greyish-bordered black line. Underside mottled with very dark chestnut-red, more densely and somewhat blackish in the female; cell-streak and discal band on forewing, and the discal band on hindwing, as above, being very pale yellowish-ochreous and sometimes tinged with violaceous-white, the marginal lines of both wings and a sinuous fascia outwardly bordering the discal band on hindwing mottled with violet-grey. *Body* and palpi above blackish; tegulæ and abdomen slightly speckled with orange-yellow scales; palpi and thorax beneath, forelegs, middle and hind femora grey; abdomen beneath, middle and hind tibiæ and tarsi pale ochreous; antennæ black, tip reddish.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{8}{10}$ , ♀ 2 inches.

*Dry-season brood* (Plate 301, fig. 2, d, e, ♂ ♀).

Male and female. Upperside similar to *wet-season* brood, except that on the forewing the reddish-ochreous cell-streak and discal band is somewhat broader, and with a distinct red line intervening between the two grey marginal lines; on the hindwing the inner-discal white band is somewhat broader and its outer edge sinuous, the outer-discal slender band being prominent, red, and sinuous. Underside similar to *wet-season* brood, but somewhat more mottled.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$ , ♀ 2 inches.

HABITAT.—South Andamans.

DISTRIBUTION.—Confined to the Andaman Isles. Mr. F. de Roëpstorff obtained numerous specimens at Port Blair.

#### RAHINDA AURELIA (Plate 302, fig. 1, 1a, b, c, ♂ ♀).

*Neptis aurelia*, Staudinger, Exot. Schmett. p. 145 (1886).

*Neptis (Rahinda) aurelia*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1895, p. 24, pl. S. fig. 15, ♀.

IMAGO.—“Female. Upperside black, with deep tawny markings. *Forewing* with

the discoidal band broad, extending well below the median vein, the end of the cell anteriorly indicated by a prominent short black bar; the discal band broad, in two portions, the anterior has its outer edge even and regularly curved, its inner edge is very irregular; the veins entering the edge from that side being defined with black, and almost dividing the band into three portions; the lower discal portion of the band consists of two parts, the anterior portion is rounded with a short narrow anterior projection, the posterior is elongated and reaches the inner margin inwardly obliquely; a broad nearly even submarginal line slightly disconnected where it is crossed by the upper median veinlet; a greatly disconnected series of indistinct marginal spots. *Hindwing* with a recurved discal band from the costa to the abdominal margin; the submarginal band very broad, broader than the discal, interiorly attenuated and not quite reaching the costa, posteriorly ending on the abdominal margin; a narrow rather indistinct marginal line. Underside. *Forewing* with the ground-colour and markings much paler than in upperside, some of the latter almost white in the middle; a narrow subcostal yellow streak; the discoidal band as above; the discal band everywhere entirely crossed by the black veins; between this and the submarginal band there is a narrow yellow line which becomes obsolete at about the middle of the wing; the marginal lines as above. *Hindwing* with the ground-colour even paler than in forewing, glossed throughout with pale shining violet; the bands as above but very pale, almost whitish; with an additional macular pale band in the middle of the wing between the discal and submarginal bands; in the discoidal cell towards its base are two prominent round dark dots, the inner one almost touching the subcostal vein, the outer one quite touching the second subcostal veinlet; anterior to the last-named dot is an irregular dark bar, which commences on the second subcostal veinlet, and ends on the costal vein."

Male. Upperside; markings as in female, except that the marginal line on both wings is less distinct, and the hindwing has a prominent broad satiny-white costal border extending to below the second subcostal veinlet. Underside as in female.

Expanse, ♂  $1\frac{5}{10}$ , ♀  $1\frac{8}{10}$  to  $1\frac{9}{10}$  inch.

HABITAT.—Khasia Hills; Burma; Tenasserim; Malay Peninsula; Borneo.

DISTRIBUTION.—"Described by Mr. de Nicéville from three females in his own collection from the Donat Range, Middle Tenasserim, and one male in Capt. E. Y. Watson's collection, captured in the Karen Hills in December" (l.c. 26). A male from Sumatra (Wallace) in the Hewitsonian collection, and also a male and female from Borneo, the female with markings above and below agreeing exactly with above description and figure, and a female from Malacca are in the British Museum. Staudinger's type is recorded from Malacca. A male and female from Kina Balu, North Borneo, and a female from Guong Ijan, Malay Peninsula, is in Mr. W. Rothschild's collection.

## RAHINDA PARAKA.

*Neptis Paraka*, Butler, Trans. Linn. Soc. Zool. 2nd ser. i. p. 542, pl. 68, fig. 2, ♀ (June, 1879). de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

*Neptis Peraka*, Distant, Rhop. Malayana, p. 150, pl. 17, fig. 2, ♀ (1883).

*Neptis (Rahinda) Paraka*, de Nicéville and Martin, Journ. As. Soc. Bengal, 1895, p. 407.

*Neptis Dahana*, Kheil, Rhop. Nias, p. 24, pl. 5, fig. 27 (1884).

*Dry-season brood* (Plate 302, fig. 2, 2a, b, ♂ ♀).

IMAGO.—Male. Upperside rich dark ochreous-brown, almost black; cilia greyish-brown. *Forewing* with a reddish-ochreous broad discoidal streak, which is indented at upper end of cell and extends irregularly below the median vein from the base; a contiguous subapical broad band, its outer edge evenly curved and its inner edge irregularly sinuous; a lower-discal oblique broad band, constricted in its middle, its upper portion somewhat rounded and pointed anteriorly inward—the point in some specimens touching the outer lower angle of the discoidal streak; beyond are two slender duller reddish-ochreous submarginal wavy lines, the first line angled inwards at the middle between the discal bands, followed by a less-defined similar outer marginal line. *Hindwing* with a broad reddish-ochreous inner-discal even-edged band, and a narrower outer-discal curved band, followed by a slender duller ochreous submarginal line; an obscure pale line also apparent between the two discal bands; subcostal patch of brown scales similarly disposed to that in *Hordonia*. Underside with the markings yellowish-ochreous and obscurely defined, the intervening ground-colour between the markings being obscure brownish-ochreous, the markings on the hindwing having slightly defined blackish-edges. *Forewing* also with the posterior base below the cell broadly glossy violet-grey and enclosing an elongated brown patch of ? glandular scales extending above and below the submedian. *Hindwing* also with the costal base slightly yellowish-ochreous, the slightly-defined darker interspace between it and the discal band being obscurely marked by a short inwardly-oblique blackish bar situated between the discal interspace of the costal and subcostal vein, also a similar outer bar below the subcostals.

Female. Upperside markings as in male, but somewhat narrower, and all with more sharply-defined edges. Underside with the markings somewhat more defined than in male, the intervening ground-colour being more dusky and greyish-ochreous. On the forewing is a very slightly defined blackish-speckled longitudinal bar within the upper basal area of the cell, followed by an outwardly-oblique shorter similar bar on the discocellular veinlets, and a longer oblique bar beyond. *Hindwing* also with the two subbasal short oblique bars more distinctly black than in the male, the lower one being continued brokenly to the abdominal margin. *Body* and palpi above ochreous-brown; tegulæ and abdomen speckled with ochreous scales, forming on the



latter a slight band; body and palpi beneath and legs pale greyish-ochreous, the middle and hind tibiæ and tarsi being very pale ochreous; antennæ black, tip reddish-ochreous.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{7}{10}$  ♀,  $1\frac{8}{10}$  inch.

*Wet-season brood* (Plate 302, fig. 2, c, d, ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat narrower, the three marginal lines on forewing distinct, and the marginal line on hindwing also very distinct. Underside with the ground-colour dusky ochreous-brown, the markings brighter yellowish-ochreous and more distinctly defined, those on the hindwing more prominently black-edged.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{7}{10}$ , ♀  $1\frac{8}{10}$  inch.

HABITAT.—Assam; Silhet; Daffa Hills; Naga Hills; Burma; Tenasserim; Malay Peninsula, etc.

DISTRIBUTION.—Mr. de Nicéville records it from “Silhet and the Daffa Hills” (Butt. Ind. ii. 80). A specimen from the Naga Hills is in Mr. W. Rothschild’s collection. “Mr. H. M. Parish obtained it in the Chittagong District in October and November” (Butt. Ind. ii. 80.). Mr. de Nicéville also records it from Jorehat, Assam; Bassein, in Arakan; Bhamo, Upper Burma; Perak, Malay Peninsula; Nias; Sumatra; Java; and Borneo” (J. A. S. Bengal, 1895, 25). We possess examples from Mergui, Malacca, Sumatra, and Sarawak, Borneo. Col. C. H. E. Adamson records it as “common in Burma” (List, p. 19). Capt. E. Y. Watson obtained “three specimens in the Upper Chindwin Hills, in April and May” (J. Bombay N. H. S. 1897, 653). Dr. J. Anderson took it in “Mergui, in March” (J. Linn. Soc. Zool. 1886, 36). We have verified specimens from Nias Island, in the collection of Mr. W. Rothschild and of Mr. H. Grose-Smith, and from Malacca, Singapore, Sumatra, Borneo, in the British Museum.

**RAHINDA ASSAMICA** (Plate 303, fig. 1, 1a, ♂).

*Rahinda Assamica*, Moore, Trans. Ent. Soc. 1881, p. 311, ♂.

*Neptis Assamica*, de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

IMAGO.—Male. Upperside dark ochreous-brown, almost black; cilia slightly alternated with grey. *Forewing* with a broad deep reddish-ochreous discoidal streak occupying the whole area of the cell and extending to middle of the disc; the discal interrupted band broad, the lower portion slightly constricted in the middle; followed by an obscure reddish slender submarginal line. *Hindwing* with a broad reddish-ochreous inner-discal band and outer-discal band, both being confluent between the

lower median and submedian vein, the abdominal margin also being reddish-ochreous; a submarginal slightly-defined reddish line. Underside with broader ochreous-yellow bands than on upperside, the very narrow costal, discal, and submarginal interspaces between the bands on forewing, and also between the basal broad area and the discal and submarginal bands on hindwing being obscure ochreous-brown. *Body* and palpi above blackish; tegulæ and abdomen slightly speckled with ochreous scales; palpi and thorax beneath, forelegs, middle and hind femora greyish; middle and hind tibiæ and tarsi, and abdomen beneath pale ochreous-yellow; antennæ black, tip reddish.

Expanse, ♂  $1\frac{7}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Assam.

DISTRIBUTION.—Of this rare species, Mr. de Nicéville records “two males, one being the type, from Sibsagar, Upper Assam, taken by Mr. S. E. Peal, in the Indian Museum, Calcutta, and one in his own collection from Hulunguri, Jorehat District of Assam, taken by Mr. J. L. Sherwill, in March. One of the Sibsagar and the Jorehat specimen differ from the type in the extent of the red markings on the upperside; in the type specimen the oblique subapical and the lower-discal bands of the forewing are separated, and the discal black band on the hindwing is wide, while in the other two specimens the former are joined, and the latter is less than half as wide” (l.c. 80). A male, labelled “Siam,” is in Mr. H. Grose-Smith’s collection.

#### RAHINDA DINDINGA.

*Neptis Dindinga*, Butler, Trans. Linn. Soc. Zool. 2nd ser. i. p. 542, pl. 68, fig. 6 (June, 1879).

Distant, Rhop. Malayana, p. 151, pl. 17, fig. 5, ♀ (1883). de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

*Dry-season brood* (Plate 303, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich ochreous-brown; markings ochreous-yellow. *Forewing* with a broad discoidal streak, slightly indented at upper end of cell and obscurely extending slightly below the cell; subapical band broad and deeply cleft at the upper radial, its outer edge curved; lower-discal band broad, constricted in its middle, its outer upper edge rounded; two marginal slender greyish lines, the inner slightly dentate between the discal bands, and the outer slightly ochreous at its posterior end. *Hindwing* with a very broad inner-discal band, and a narrower outer-discal curved band, followed by a slender submarginal distinct ochreous-yellow line, which is somewhat sinuous in the female. Underside with the markings paler yellowish-ochreous and well-defined, but broader, the intervening ground-colour being ochreous-black; the two marginal lines on forewing greyish-ochreous; on the hindwing the marginal lines are ochreous; a distinct greyish-

ochreous lunular line extending medially along the dark interspace between the yellow discal bands, and the subbasal dark band has a slight outwardly projected angle between the costal and subcostal vein.

*Wet-season brood* (Plate 303, fig. 2, d, e, ♀).

Male and female. Upperside with the discoidal streak, and discal bands on both wings comparatively narrower, the marginal lines grey, the line on hindwing tinged with ochreous posteriorly. Underside with the markings narrower, as above, the ground-colour darker, otherwise as in *dry-season* brood.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 to  $2\frac{1}{10}$  inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula; Borneo.

NOTE.—This species has similar markings on the upperside to *Dorelia* and *Sattanga*, but the bands are broader in both *dry* and *wet* forms. *Dindlinga* may be easily distinguished from them by the submarginal lines on forewing being grey—whereas in the others the inner line is prominently ochreous. On the underside, the bands are also broader, the marginal lines on forewing being greyish, and on the hindwing the interspaces between the bands are prominently defined by black edging.

DISTRIBUTION.—A male, taken in the Ataran Valley, in March, and a female from the Houndraw Valley, Burma, taken in October, and a male from the Mepley Valley, Tenasserim, in January, by Capt. Bingham, and the type specimen from Malacca, are in the British Museum. A male from Borneo is in Mr. Grose-Smith's collection, and a female from Sandakan, N. Borneo, is in Colonel Swinhoe's collection.

CHINESE AND MALAYAN SPECIES.—*Rahinda Bieti* (Neptis Bieti, Oberthür, Etudes Ent. xix. p. 16, pl. 8, fig. 69 (1894). *Habitat.* W. China.—*Rahinda Rihodana* (Neptis Rihodana, Moore, P. Z. S. 1878, p. 698. *Habitat.* Hainan.—*Rahinda Sandaka*, Butler, Proc. Zool. Soc. 1892, p. 120. *Habitat.* N. Borneo.—*Rahinda Doronia* (Neptis Doronia, Staudinger, Deuts. Ent. Zeit. 1889, p. 59. *Habitat.* Palawan.—*Rahinda tricolor* (Neptis tricolor, Staudinger, *l.c.* 1889, p. 60. *Habitat.* Palawan.—*Rahinda Heliobole* (Neptis Heliobole, Semper, Reise Phil. Lep. p. 151, pl. 30, fig. 19, 20. *Habitat.* Mindanao. *Rahinda Epira* (Neptis Epira, Felder, Reise, Nov. Lep. pl. 56, fig. 9, 10. Semper, *l.c.* p. 151. *Habitat.* Luzon.

### Genus LASIPPA.

*Lasippa*, Moore, Lep. Indica, iii. p. 146 (1898).

IMAGO.—Male. *Forewing* more triangular in shape than in typical *Rahinda*; the exterior margin being more oblique, and also even; first and second subcostal branches both emitted before end of the cell; base of posterior margin of the underside

broadly glossy greyish-white enclosing a very pale brown patch of scales above the submedian vein. *Hindwing* with the exterior margin more oblique, and even; both subcostal branches emitted together opposite the precostal vein; radial at some distance from base of the second subcostal; costal border, basally, broadly glossy greyish-white, extending to below base of the radial veinlet, and in the *dry-season* form, isolating an elongated unglossed brownish patch of scales between the bases of subcostals. *Body* slender; palpi slender, laxly clothed with fine hairs; antennal club slender.

TYPE.—L. *Heliodore* (Fabr.).

### LASIPPA HELIODORE.

*Papilio Heliodore*, Fabricius, Ent. Syst. iii. i. p. 130 (1793). Jones, Icones, iv. pl. 76, fig. 2, ♂ (*dry form*).

*Neptis Heliodore*, Butler, Catal. Fabr. Lep. Brit. Mus. p. 62 (1869).

*Neptis Tiga*, Moore, Proc. Zool. Soc. 1858, p. 4. de Nicéville, Butt. of India, etc., ii. p. 82 (1886). Distant, Rhop. Malay. p. 151, pl. 17, fig. 4, ♂.

*Neptis Dorelia*, Butler, Trans. Linn. Soc. Zool. 1879, p. 542, pl. 67, fig. 3. Distant, *l.c.* p. 152, pl. 17, fig. 3 (*wet form*).

*Dry-season brood* (Plate 304, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich ochreous-black; cilia greyish-brown. *Forewing* with a rich yellowish-ochreous discoidal streak which does not extend below the median vein, it is indented at the discocellulars by a slender ochreous-centred wedge-shaped mark; a subapical broad band somewhat irregularly edged on both sides, a lower-discal oblique broad band which is slightly constricted in its middle, and the upper portion sinuous outwardly; beyond is a prominent ochreous somewhat broad lunular submarginal line and a very slender less-defined dull ochreous marginal line. *Hindwing* with a yellowish-ochreous broad inner-discal band which widens anteriorly, and a narrow outer-discal curved band, followed by a slender dull ochreous submarginal line; costal border, basally, broadly, glossy greyish-white, extending to below base of the radial veinlet, and isolating an elongated unglossed brownish patch of scales between bases of the subcostals. Underside with pale dull yellowish-ochreous less-defined markings, as above, except that the discoidal streak extends very slightly below the cell, the intervening ground-colour being uniformly pale obscure ochreous-brown. *Hindwing* also with the costal base pale yellowish-ochreous well separated from the subbasal dark band by the costal vein; and in the male the subbasal dark band has a projecting outward angle between the subcostal veins. *Body* and palpi above black; tegulæ and band on base of abdomen ochreous; palpi and thorax beneath, forelegs, and hind femora pale-greyish; abdomen beneath and hind tibiæ and tarsi pale ochreous; antennæ black.

Expanse, ♂  $1\frac{8}{10}$ , ♀  $1\frac{9}{10}$  inch.

*Wet-season brood* (Plate 304, fig. 1d, e, ♂ ♀).

Male and female. Upperside with somewhat deeper yellowish-ochreous markings, the discoidal streak and discal bands on both wings narrower than in *dry-season* brood, but the submarginal line on both wings is more distinct, and on the forewing the latter is somewhat broader and lunulated, the discoidal streak has a more distinctly-defined wedge-shaped ochreous-centred mark, which in some extends almost to the base of upper median veinlets, and the lower portion of the discal band is more constricted in the female. Underside with the markings, as above, yellowish-ochreous and broader, the discoidal streak extending below the cell, the intervening ground-colour being darker and more regularly defined than in the *dry-season* brood.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{7}{10}$ , ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Lower Burma; Tenasserim; Siam; Malay Peninsula; Sumatra; Java; Borneo.

DISTRIBUTION.—The type specimen of *Heliodore*, in the Banksian cabinet at the British Museum, is recorded from Siam. A male of the *dry-season* form, from Shillong, Khasia Hills, is in Mr. P. Crowley's collection, and a female of the *wet-season* form, from Assam, in Mr. W. Rothschild's collection. We possess a *dry-season* female from Bayah Choung, Burma, taken in February by Col. C. H. E. Adamson, and both sexes from Mergui; a female from Meetan, Upper Tenasserim, is in the British Museum. Of the *wet-season* form we have a male from Mergui, a female from Malacca, and both sexes from Sumatra. Dr. J. Anderson obtained it in "Mergui, in November and December, Sullivan Island in January, and Elphinstone Island in February" (J. Linn. Soc. Zool. 1886, 36). In the British Museum are specimens from Malacca (*Dorelia*), and from Java (*Tiga*). Mr. W. Rothschild has examples from Java and Borneo.

**LASIPPA KUHASA** (Plate 304, fig. 2, 2a ♂).

*Neptis Kuhasa*, de Nicéville, Butt. of India, etc., ii. p. 84 (1886); Journ. Asiatic Soc. Bengal, 1886, p. 250, pl. xi. fig. 12, ♂; *id.* p. 356 (1886).

IMAGO.—"Male. Upperside black, with orange markings. *Forewing* with a broad discoidal streak bounded below by the median vein, obscurely separated from the large triangular spot beyond by two fine black lines; a broad subapical patch well separated from a rather less broad lower-discal patch, which reaches the inner margin, and is strongly constricted at the first median veinlet; a prominent submarginal somewhat lunate band, with a very obscure and fine pale marginal line. *Hindwing* with a broad straight even discal band, and a similar but narrower submarginal band about one-third the width; marginal line as on forewing.

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Underside. Both wings with the ground-colour much paler, and the bands also paler, ochreous rather than orange. *Forewing* marked as above. *Hindwing* with an additional ochreous band at the base of the costal margin, the discal and submarginal bands broader, with the band of the ground-colour between them narrower, the outer margin broadly fuscous, bearing a prominent ochreous line.

“Female. Both wings slightly paler. *Hindwing* with the discal band narrower, the submarginal band wider than in male. Underside with the same differences as above.”

Expanse, ♂  $1\frac{9}{10}$ , ♀ 2 inches.

HABITAT.—Cachar.

DISTRIBUTION.—“Mr. J. Wood-Mason took one male in July, and two females in August, at Irangmara in Cachar, now in the possession of the Indian Museum, Calcutta” (*l.c.* 84).

#### LASIPPA SATTANGA.

*Rahinda Sattanga*, Moore, Trans. Ent. Soc. 1881, p. 311, ♀.

*Neptis Sattanga*, de Nicéville, Butt. of India, etc., ii. p. 83 (1886).

*Dry-season brood* (Plate 305, fig. 1, 1a, ♂).

IMAGO.—Male and female. Upperside olivescient ochreous-black; markings yellowish-ochreous, paler than in *Heliodore*, and very sharply defined. *Forewing* with the discoidal streak entire and sharply defined along lower edge of cell, but with a very slightly-defined wedge-shaped ochreous-centred mark at upper end of the cell; subapical and lower-discal band irregularly-edged, the latter much constricted in its middle, and in some specimens of female connected only by scattered yellow scales; submarginal yellow line narrow, distinct, and slightly lunular; marginal line in male yellow, in female greyish and indistinct. *Hindwing* with a broad inner-discal band, and a much narrower outer-discal band; submarginal line very obscure and pale greyish, not ochreous as in *Heliodore*. Underside with paler ochreous-yellow, broader and less defined markings, the intervening ground-colour obscurely defined and of a pale ochreous-brown.

*Wet-season brood* (Plate 305, fig. 1, b, c, ♀).

Upperside; markings somewhat narrower than in *dry-season*, and narrower than in *wet-season Heliodore*. Underside with all the bands more distinctly defined, and their interspaces darker ochreous-black.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Upper Burma.

DISTRIBUTION.—Specimens from Burma, and of both sexes from Tilin Yaw, taken by Capt. E. Y. Watson during the Chin-Lushai Expedition of 1889-90, in January, February and March, and from Yedu Yaw, Burma, in November, are in the British Museum. We possess the type female, and other specimens, also from Burma,

**LASIPPA CAMBOJA** (Plate 305, fig. 2, 2a, ♂).

*Neptis Camboja*, Moore, Proc. Zool. Soc. 1879, p. 136, ♂.

IMAGO.—Male. Upperside. *Forewing* with a pale ferruginous-yellow broad discoidal streak, extending below the cell a broad oblique subapical band, and a broad constricted lower-discal band; also two slender indistinct ferruginous-yellow marginal lines. *Hindwing* with a broad ferruginous transverse discal and a narrow slightly curved submarginal band, also a single indistinct slender ferruginous marginal line. Underside pale yellowish-ferruginous; bands as above, but indistinctly defined.

Expanse,  $1\frac{5}{10}$  inch.

HABITAT.—Cambodia.

The type specimen, taken by Mr. Mouhot, was in the late Mr. N. C. Tully's collection, and of which our illustrations represent the upper and underside.

MALAYAN ALLIED SPECIES.—*Lasippa Siaka* (*Neptis Siaka*, Moore, Trans. Ent. Soc. 1881, p. 311, ♀). Male and female. Upperside with sharply-defined reddish-ochreous markings, the discoidal streak completely divided across end of cell by a black bar, the outer portion being short and triangular; the transverse discal band divided into three portions, its middle portion being well and completely separated from the lower; submarginal ochreous line formed of separate lunules. *Hindwing* with a straight inner-discal band, and a much narrower straight outer-discal band, the submarginal line slender and indistinct. Underside with well defined dusky-black interspaces between the yellowish-ochreous markings, as above. Expanse ♂  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  inch. *Habitat*.—Sumatra; Nias; Borneo.

MALAYAN ALLIED GENERA.—Genus *BACALORA* (Moore, Lep. Ind. iii. p. 146 (1898)).—Male. *Forewing* elongate, subtriangular; apex obtusely rounded, exterior margin oblique and slightly concave in the middle; first subcostal branch emitted at one-fifth, and second branch immediately before end of the cell. *Hindwing* broadly ovate; apex rounded, exterior margin very oblique and slightly scalloped, anal angle obtuse; precostal vein bent abruptly outward beyond the middle; second subcostal emitted very close to costal, radial at considerable distance beyond;

cell area broad. *Type.* *Bacalora Pata*.—*Bacalora Pata* (Neptis Pata, Moore, Proc. Zool. Soc. 1888, p. 4, pl. 49, fig. 1, ♂. Semper, Reis. Phil. pl. 30, fig. 6, ♀. *Syn.* N. Isabellina, Felder, Wien. Ent. Monats. 1863, p. 114. *Habitat.* Manilla; Luzon.—*Bacalora Semperi* (N. Isabellina, Semper, Reisen Phil. Lep. p. 151, pl. 30, fig. 4, 5 (*nec* Felder). *Habitat.* S. Mindanao.—*Bacalora Patalina* (N. Patalina, Staudinger (Semper, Reis. Phil. Lep. p. 347 (1892). *Habitat.* Mindoro.

Genus *ATHARIA* (Moore, Lep. Ind. iii. p. 146 (1898).—*Neptis* (sect. 7, part), Felder, Neues Lep. p. 31 (1861).—Male. *Forewing* elongate, rather narrow, subtriangular; costa arched at the base, apex very obtuse, exterior margin oblique, slightly convex and almost even, posterior margin recurved; first subcostal branch only emitted before end of the cell, second subcostal emitted at one-fourth beyond the cell; discocellulars outwardly-oblique; cell open. *Hindwing* rather elongate, anterior margin almost straight, apex obtuse, exterior margin obliquely-convex and almost even; precostal vein abruptly bent outward; costal vein ending at a short distance before the apex. *Body* slender; palpi more slender than in *Rahinda*, and comparatively less laxly hairy; eyes naked; antennæ slender. *TYPE.* A. consimilis.—*Atharia consimilis* (Limenitis consimilis, Boisd. Voy. Astrolabe, Lep. p. 133). Snellen, Tijds. voor Ent. 1889, p. 388, pl. 9, fig. 2. Staudinger, Exot. Schmett. pl. 50. *Habitat.* New Guinea; N. Australia.—*Atharia affinis* (Neptis affinis, Felder, Novara Reise, Lep. iii. p. 426). *Habitat.* Aru.—*Atharia continua* (Neptis continua, Staudinger, Exot. Schmett. p. 146). *Habitat.* Jobi.

Genus *ANDASENODES* (Moore, Lep. Ind. iii. p. 146 (1898).—*Forewing* elongated, narrow; costa almost straight, apex rounded, exterior margin very slightly oblique, scalloped, posterior margin long, recurved; first and second subcostal branches emitted before end of the cell; discocellulars very short, second outwardly-oblique; cell open. *Hindwing* rather elongated and narrow; anterior margin well arched, exterior margin very oblique, convex, scalloped; precostal short, straight. *Body* moderately stout; palpi slender, laxly clothed with long fine hairs; antennal club stout, obtuse at tip; eyes naked. *TYPE.* A. mimetica.—*Andasenodes mimetica* (Neptis mimetica, Grose-Smith, Nov. Zool. ii. p. 78 (1895). A mimic of the Euploëine butterflies *Andasena Orope*, and of *Doricha variabilis*. *Habitat.* Dili, Timor.—*Andasenodes Eblis* (Neptis Eblis, Butler, Ann. Nat. Hist. 1882, p. 43. Grose-Smith and Kirby, Rhop. Exot. *Nept.* pl. 1, fig. 1, 2 (1895). A mimic of, probably, a species of *Calliplœa*. *Habitat.* New Britain.

Genus *RASALIA* (Moore, Lep. Ind. iii. p. 146 (1898).—Male. Wings small. *Forewing* subtriangular; costa very slightly arched, apex rounded, exterior margin slightly oblique, scalloped, posterior margin much recurved; first and second subcostal branches emitted before end of the cell; discocellulars very short, second



bent inward; cell open. *Hindwing* broadly ovate, short; anterior margin much arched, exterior margin convex and scalloped; precostal vein bifid; costal vein ending at fully one-third before the apex. *Body* slender; palpi very slender; eyes naked. TYPE. *R. gracilis*.—*Rasalia gracilis* (Athyma gracilis, Kirsch, Proc. Zool. Soc. 1885, p. 276, pl. 19, fig. 4). *Syn.* Neptis Dohertyi, Grose-Smith, Nov. Zool. ii. 1895, p. 79. *Habitat.* Tenimber, Timor Laut.

## Group V. NYMPHALINA.

*Hamadryades*, Hübner, Tentamen, p. 1 (1806).

*Nymphalides* (part), Boisd. Ind. Méth. p. 16 (1840).

*Vanessidæ*, Duponchel, Catal. Méth. Lep. Eur. p. 6 (1844).

*Vanessidi*, Stephens, Catal. Brit. Lep. B. M. p. 11 (1850). Stainton, Manual Brit. Lep. p. 21 (1857).

Scudder, Butt. E. U. S. p. 306 (1889).

*Vanessides*, Kirby, Eur. Butt. p. 36 (1862). Butler, Catal. Fabr. Lep. p. 69 (1869).

*Nymphalina* (part), Herr. Schœff. Prod. Syst. Lep. p. 17 (1864). Distant, Rhop. Malay. p. 83 (1882).

*Nymphalides* (part), Butler, Catal. Fabr. Lep. p. 46 (1869).

*Diademæ* (part), Butler, Catal. Fabr. Lep. p. 98 (1869).

*Nymphalidæ* (part), Lang, Rhop. Eur. p. 159 (1884).

*Kallimæ et Apaturinæ*, Doherty, Journ. As. Soc. Bengal, 1886, pp. 109, 121.

*Nymphalidæ* (Vanessa group, part), Staudinger and Schätz, Exot. Schmett. ii. p. 122 (1887).

*Nymphalina*, Moore, Lep. Indica, ii. p. 225 (1895).

## CHARACTERS OF THE GROUP NYMPHALINA.\*

IMAGO.—*Forewings* elongately triangular, or triangular; apex obtusely angled or rounded, in some produced to a more or less distinct point; exterior margin either more or less slightly scalloped and with a more or less prominent outward angle below the apex and a lesser angle at the lower median veinlet, or the entire margin slightly but obtusely scalloped, or more or less even. *Hindwings* short, obovate, or somewhat quadrate, the exterior margin either more or less slightly scalloped, or nearly even, or, in some the apex is slightly excised, and with a short broad caudate angle at end of the upper median veinlet; or, in some the wing is triangular, with the exterior margin nearly or quite even, and the anal angle produced into a lobate tail.

LARVA.—Head mostly very slightly cleft, in some surmounted with two minute tuberculous-spines or very short stellate-spines, or armed with two long erect branched-spines or two fleshy-spines. Body armed with longitudinal series of branched-spines, or with a single dorsal fleshy-spine on sixth and twelfth segment.

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\* See Note in Lep. Indica, vol. ii. p. 226.

PUPA.—Stout; dorsum arched, abdominal segments mostly with dorsal and lateral conical points; thorax obtusely or angularly conical posteriorly; head-piece more or less bifid.

SEASONAL DIMORPHISM.—We have separated and described the *wet-season* and *dry-season* forms occurring in the genera *Cyrestis*, *Apsithra*, *Junonia*, *Polygonia* (Grapta), *Araschnia*, *Symbrenthia*, *Apatura* (Hypolimnas), and *Kallima*.

MIMICRY.—In the genus *Apatura* (Hypolimnas) the two well-known species *Bolina* and *Misippus* furnish the most striking examples of mimicry to be found among butterflies. Colonel C. Swinhoe, in his paper on "Mimicry in butterflies of the genus Hypolimnas" (Journ. Linn. Soc. Zool. 1895, p. 340), writes: "In *Bolina*, Linn., as we find it in Asia, the female only is mimetic, the males in all localities being of the normal form. In India the female universally mimics the common protected butterfly, *Euplœa Core*, of Cramer. The typical *Core* does not range very far South, one or two have been taken in Mergui, but there is no record of its more Southern extension, its place being taken by other common black *Euplœas* of somewhat similar pattern. We find accordingly, that *Bolina* varies so as to resemble all the common *Euplœas* of the different islands of the Malay Archipelago. The female of *Misippus*, with the exception as a very rare variety, which resembles the male in appearance, always mimics the commonest of all the *Danaïnæ*, i.e. *Danaïs Chrysippus*, which is common all over India, Burma, Ceylon, the Malay Archipelago, Madagascar, Aden, and the West, South, and South-East Coasts of Africa; in all these localities *Misippus* also exists, the female being of the *Danaïs* colour and pattern, and where *D. Chrysippus* does not exist, *Misippus* is not to be found. In Africa and Aden there are several forms of *Danaïs Chrysippus*—some without the white-banded black apical patch to the forewings (*D. Dorippus*, Klug); some possessing this marking, but characterized by white hindwings (*D. Alcippus*, Cramer); and also others with the *Dorippus* pattern and white hindwings. All these forms are mimicked in their several localities by the females of *Misippus*. In India, the form of female *Misippus* which mimics *Danaïs Dorippus* (without the black and white apical patch) is also found." The form of female *Misippus* which mimics *Danaïs Alcippus* (Alcippoides, Moore) is also occasionally found in India.

#### Genus CYRESTIS.

*Cyrestis*, Boisduval, Voy. Astrolabe, p. 117 (1832); *id.* Ann. Mus. Hist. Nat. 1833, p. 190. Westwood, Gen. D. Lep. ii. p. 260 (1850). Distant, Rhop. Malay. p. 139 (1883). de Nicéville, Butt. of India, etc., ii. p. 248 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 155 (1888). *Cyrestis* (sect. 1), Felder, Neues Lep. p. 24 (1861).

IMAGO.—Wings short. *Forewing* rather broad, triangular; costa slightly arched, apex obtusely pointed, exterior margin slightly oblique and sinuous, ex-

cavated above the posterior angle, posterior margin recurved; costal vein extending to middle of costa; first subcostal veinlet emitted at one-fifth before end of the cell and ending at a little beyond the costal vein; second subcostal at one-tenth before end of cell; third subcostal at fully one-half beyond the cell; the cell very short and broad, closed; upper discocellular veinlet very short, middle discocellular concave, lower discocellular almost straight, very slender; middle median veinlet emitted close to lower end of cell. *Hindwing* broad and prolonged posteriorly; anterior margin rather short, lobate at the base and excavated before the apex, which is acute; exterior margin oblique, scalloped from the apex and produced to a spatular-tail at end of upper median veinlet and broadly-lobate between lower median and the submedian; precostal vein curving from its base, slender, simple; costal vein much arched from base of precostal and thence extending close along the margin to near the apex; cell broad, closed; subcostal branch widely separated from the costal; upper discocellular outwardly curved, lower discocellular outwardly oblique and very slender; middle median emitted close to end of cell. *Body* slender; palpi long, rather slender, directed upwards to middle of eyes and then porrected and projecting more than half its length beyond the head, somewhat cylindrical, the sides slightly flattened, very compactly clothed with short hairy scales which are slightly lax above and at base beneath, terminal joint nearly as long as second and obtusely pointed; forelegs of male short, very slender; femur scaly above, clothed beneath with fine long silky hairs; tibia scaly; tarsus sparsely clothed with very short hairs. Forelegs of female longer; femur scaly above, finely hairy beneath; tibia and tarsus smooth; tarsus broadly dilated towards end, apical joints minute, stoutly spined; antennæ slender, with a gradually-formed elongate club; eyes naked. *Type*.—C. Thyonæus.

LARVA (C. Thyodamas).—"Slender, cylindrical, smooth; with two long, curved, divergent filaments, or soft horns, on the head; a single stouter sword-shaped one on the back of the fifth or sixth segment, curved backwards and serrated on its inner edge; another on the last segment, curved forwards and serrated on its outer edge" (*Davidson*).

PUPA.—"Suspended by the tail. Very much compressed; with a dorsal ridge from head to tail, high and obtusely pointed in the middle; palpi cases united and produced into a long somewhat recurved snout" (*Davidson*).

EGG.—"High domed-shape, or almost conical, with an aperture at the top fitted with a deeply dentate flat cap, like a cogged wheel" (*Davidson*).

HABITS OF IMAGO.—"All the species of this genus are very elegant insects on the wing, having a floating sailing flight, often settling on the wet sand on the borders of a stream to suck up the moisture, with wings very wide outspread and lying flat on the ground, the forewings much advanced in front of the head; if disturbed they

disappear with great rapidity, as they settle suddenly with outspread wings on the underside of a leaf, where they are quite invisible from above. They are nearly always found near water. In Simla, *Thyodamas* may often be seen at rest on a bare quartz rock in mid-stream, its delicately pencilled markings exactly harmonizing with the veinings of the stone" (*de Nicéville*).

**CYRESTIS THYODAMAS** (Plate 306, fig. 1, 1a, larva and pupa, 1, b, c, ♂ ♀).

*Cyrestis Thyodamas*, Boisduval, Cuvier's Rég. Anim. Ins. ii. pl. 138, fig. 4 (1836). Doubleday and Hewitson, Gen. D. Lep. pl. 32, fig. 3 (1848). Westwood, *id.* ii. p. 261 (1850). Butler, Ann. Nat. Hist. 1885, p. 307. de Nicéville, Butt. India, ii. p. 251 (1886). Leech, Butt. of China, etc., i. p. 248 (1892). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 256, pl. 3, fig. 2, larva. Mackinnon, *id.* 1898, p. 376, pl. U, fig. 11, larva and pupa. Staudinger and Schätz, Exot. Schmett. ii. pl. 23 (1888).

*Amathusia Ganescha*, Kollar, Hugel's Kaschmir, iv. pt. 2, p. 430, pl. 7, fig. 3, 4 (1844).

*Cyrestis Ganescha*, Butler, Ann. Nat. Hist. 1885, p. 308; *id.* P. Z. S. 1886, p. 363.

IMAGO.—Male and female. Upperside either pure white (probably *wet-season* brood) or of various shades from white to pale rich yellowish-ochreous (probably *dry-season* brood); veins mostly black. *Forewing* crossed by four irregularly-undulated slender black lines, the first line subbasal, second and third medial, the fourth discal and sinuous posteriorly, followed by three submarginal parallel lines; interspaces between the discal and outer lines, apically, more or less powdery fuliginous-brown or grey, with a small, white-centred oval spot between the veins, the lower outer interspaces broken by a fuliginous or olive-brown patch, the inner median and submedian spaces being more or less bright ochreous and inwardly edged with steel blue, the latter centred with three prominent white spots inwardly edged with black; base of costal border brownish-ochreous; a subbasal black line across the cell, a curved line before the end, and two discocellular lines, their upper interspaces and a costal patch beyond being brownish-ochreous. *Hindwing* crossed by three medial slender black lines, the middle line angulated towards the costa, followed by a broader outer-discal black line, outwardly-edged with steel blue, a slender inner-submarginal wavy line, and then by two outer thicker irregular lines, between the outer-discal and inner submarginal is a row of elongated oval white spots, which are inwardly-edged with black and bordered anteriorly with olivescence-ochreous, and posteriorly with yellowish-ochreous; anal lobes, more or less, yellowish-ochreous, or brownish-ochreous, irregularly marked with black spots and streaks edged with white; abdominal border brownish-ochreous, edged by a black streak at base of costa; tail black, edged with white. Underside paler and of a pinkish-white; markings as above, but less prominent, the anal lobes brighter ochreous and the black spots

larger; costa and abdominal border white. *Body* with a dorsal and lateral black stripe edged with white or pale ochreous; palpi above clothed with black and ochreous hairs, beneath ochreous-white; legs white; antennæ black, annulated with white beneath.

Expanse, ♂ ♀ 2 to 2 $\frac{8}{10}$  inches.

LARVA.—“Slender, cylindrical, smooth; with two long, curved, divergent filaments or soft horns on the head, a single stouter sword-shaped one on the back of the fifth or sixth segment, curved backwards and serrated on its inner edge, and another on the last segment, curved forwards and serrated on its outer edge. Colour fine reddish-brown, with a broad green band on the side from the fifth to the last segment. Feeds on the leaves of *Ficus indica*.”

PUPA.—“Suspended by the tail; very much compressed; with a dorsal ridge from head to tail, high and obtusely pointed in the middle; palpi cases united and produced into a long somewhat recurved snout; colour brown, with fine dark striæ.”

EGG.—“High-domed shape, or almost conical, with an aperture at the top fitted with a deeply dentate flat cap, like a cogged wheel” (*Davidson, l.c.* 351).

HABITAT.—W. and E. Himalayas; Assam; Cachar; Khasias; Bombay; S. India; Burma; Tenasserim; W. China; Hainan; Formosa; Japan.

DISTRIBUTION.—We possess examples of both the white and pale ochreous forms from the Western Himalayas, taken at Kasauli, Simla, and Masuri, a white male from Nepal, taken by the late Gen. G. Ramsay, both sexes from Sikkim, Assam, and the Khasias; others from S. India, taken in the Wynaad and Nilgiris, a pale ochreous female from Coorg, a white male from Mynal, Travancore, taken in March, at 2000 feet elevation; white males from Bhamo, taken in November by Signor L. Fea, from Upper Burma, by Col. C. H. E. Adamsom, a male from Moolai, Upper Tenasserim, and white males from W. China and Japan. Mr. J. H. Leech has both sexes of the white and ochreous forms from Moupin, and Omeishan, W. China, and a white female from the Loochoo Islands. It is also recorded from Hainan (*P. Z. S.* 1878, 698), and from Formosa (*id.* 1877, p. 813). The late Capt. R. Bayne Reed took it in Kashmir in 1872 (*MS. Note*), and Capt. H. B. Hellard also took it in “Kashmir in September” (*MS. Notes*). Mr. P. W. Mackinnon found it “very common in Masuri and in the interior, and it is not rare in the Doon. It flies all through the warm weather.” Capt. A. M. Lang took it at “Kasauli in May, and at Kundloo from April to October” (*MS. Notes*). The Rev. J. H. Hocking records it from the Kangra Hills, “June to September, hibernates afterwards. Sits with open wings upon hanging leaves of Oak and Rhododendron” (*P. Z. S.* 1882, 240). Mr. W. S. Atkinson records it from “Hills in Central India, Parisnath Hill, Sikkim, and Khasias” (*MS. Notes*). Col. C. Swinhoe records it as “common on the Khasia

Hills" (Tr. Ent. Soc. 1893, 288). Mr. E. H. Aitken observed it as "rare at Mahableshwar, Bombay."

Mr. W. Doherty records it from "Kumaon generally, at 2000 to 8000 feet elevation" (J. A. S. Beng. 1886, 122). Major J. W. Yerbury obtained the male at "Murree, N.W. Himalayas, in August" (P. Z. S. 1886, 363). Mr. S. N. Ward took it in "Malabar and Kanara." Mr. G. F. Hampson took it "throughout the Nilgiri District," and remarks that the yellow form does not occur there (J. A. S. Beng. 1888, 355). Mr. H. S. Ferguson records it as "common on the Travancore Hills" (J. Bombay N. H. S. 1891, 9). Capt. E. Y. Watson took "numerous specimens at Kathlekan, Mysore, in November, and at the Gersoppa Falls in January (*id.* 1890, 5). "Common in Sikkim up to about 6000 feet elevation, from March to December" (H. J. Elwes, Tr. Ent. Soc. 1888, 365). In the British Museum is an ochreous female from Bhotan, taken in July, others of the white form from Tilin Yaw, Burma, taken in November, Papun in December, and King Island, Mergui, December. Dr. F. Manders records it from "Fort Stedman, Shan States, and Eastern Karenee, Burma" (Tr. Ent. Soc. 1890, 525).

HABITS OF IMAGO.—"This beautiful insect, very appropriately called 'the map butterfly,' is frequently to be seen soaring backwards and forwards over some mountain stream, with richly wooded sides. It frequently settles, often with wide-spread wings, on a quartz rock, where, by reason of its coloration and markings, it is almost impossible to see. It has also a habit of suddenly settling on the *underside* of some broad leaf overhanging the water, with wings wide outspread, a feat of gymnastics I have never seen any other butterfly accomplish. It is on the wing from early summer, and I have taken perfect specimens as late as the middle of November at Simla" (de Nicéville, Indian Agriculturist, 1880). "A Western-Himalayan forest-insect, difficult to capture at all. It generally frequents a well-wooded glen; and in such a place I have often watched its elegant soaring flight, far out of reach, as it flitted over the blossoms of the horse-chestnut (*Pavia indica*), or rested on its broad leaves in the sunshine. I have also seen it floating up and down the foliage-covered face of a steep cliff overhanging a hill torrent, and rarely would it come within reach" (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 132). "The 'map butterfly' is pretty common throughout the Karwar District of Bombay, in suitable situations—such as clear streams of running water among rocks, with trees growing over it, on which the butterfly may rest, pressed flat against the underside of a leaf. Curiously enough it lays its eggs on the Banian tree (*Ficus indica*), which is not a tree at all peculiar to such situations (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 256; *id.* 1890, 351).

FOOD-PLANTS OF LARVA.—A female was noticed by Mr. J. R. Bell, on October 10th, depositing its eggs on the tenderest leaves and buds of the Banian tree

(*Ficus indica*), and secured six, of which two were reared" (E. H. Aitken, *id.* p. 351). Mr. P. W. Mackinnon found the "larva, in Masuri, feeding on *Ficus nemoralis*, and in the Doon, upon *Ficus glomerata*" (J. Bomb. N. H. S. 1898, 376).

Of our illustrations of this species on Plate 306, fig. 1 is a reproduction of Mr. Mackinnon's figures, and fig. 1a of Mr. Davidson's figures, of the larva and pupa; fig. 1b is a male of the white (*wet-season*) form, and fig. 1c, a female of the pale ochreous (*dry-season*) form.

**CYRESTIS ANDAMANICA** (Plate 306, fig. 2, 2a, ♂ ♀).

*Cyrestis Thyodamas*, var. *Andamanica*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 246.

*Cyrestis Thyodamas*, var. *Andamanensis*, Staudinger, Exot. Schmett. p. 132, pl. 45, ♂ (1888).

IMAGO.—Male and female. "Differs from Continental Indian and Burmese *C. Thyodamas* in the blacker apex and outer margin, in the prominent somewhat diffused black spot on the third median veinlet between the third and fourth transverse black lines of the forewing, and in having the fulvous marks of the anal half of the abdominal margin, of the anal angle, and of the outer margin as far as the discoidal vein, of the hindwing, much diffused and darker; in having, in fact, all the markings and colouring darker both above and below."

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

HABITAT.—South Andamans.

**CYRESTIS NIVALIS** (Plate 307, fig. 1, 1a, ♂).

*Cyrestis Nivalis*, Felder, Reise Novara, Lep. iii. p. 414 (1866). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 429.

*Cyrestis Nivea*, var. *Nivalis*, Distant, Rhop. Malay. p. 140, pl. 12, fig. 3, ♂ (1883).

*Cyrestis Nivea*, de Nicéville, Butt. of India, etc., ii. p. 252 (1886).

*Cyrestis Nivea*, var. *interrupta*, Snellen, Tijds. Ent. 1890, p. 217.

IMAGO.—Male and female. Upperside white. *Forewing* crossed by three outwardly-curved oblique waved equidistant very slender black lines, the first subbasal, the second medial, and the third discal; base of costal border to medial transverse line irregularly black and longitudinally streaked with ochreous; cell crossed by a slender black line near the base, and with two similar waved lines at the end; outer margin with a broad black band traversed by three entire outer and two broken inner pale fuliginous-white slender lines, the two inner upper lines with an intervening white oval dot, the inner edge of the band is irregularly waved—being

in reality a fourth transversal line, its middle portion excavated between the radial and middle median veinlet, its lower end zigzag, the posterior angle being broadly bright ochreous with two black central dots and short ascending outer white streaks. *Hindwing* crossed by three similar-positioned oblique almost straight very slender black lines, the two inner angularly bent upward near the abdominal margin, the inner one extending upward in a black streak to the base of the costa; two submarginal black streaks curving from the costal angle to near anal angle, their lower ends waved, followed by an outer parallel slender line, then by an oblique streak from the upper marginal angle, and again by a slender marginal line, the latter ending in two black caudal marginal streaks; lower area of abdominal border, the anal lobe and lower outer border of the streaks bright ochreous; anal lobes with black spots and short white streaks. Underside white; transverse lines and marginal borders as above, but paler; costal basal band and abdominal marginal markings absent. *Body* above with a dorsal and lateral longitudinal black streak bordered with ochreous and white; body beneath and legs white; palpi above clothed partly with black and ochreous hairs, beneath white; antennæ black, partly annulated with white beneath.

Expanse, ♂ 2 to  $2\frac{3}{10}$ , inches.

HABITAT.—Upper Burma; Tenasserim; Malay Peninsula, Penang; Sumatra; Sarawak; Borneo.

DISTRIBUTION.—“Found commonly in Burma, the Malay Peninsula, Sumatra, and Borneo. In Sumatra it is found on forest roads, where it settles with wide-spread wings on moist places and by the side of small pools; if pursued, it settles on the underside of leaves by the roadside. On the wing, when flying rapidly along a forest road in search of moisture, it may easily be taken for a Pierine butterfly” (de Nicéville J. A. S. Beng. 1895, 429). Lieut. E. Y. Watson took it in “Upper Burma in the spring, and Capt. Bingham in the Donat Range in April, and in the Thoungyeen forests in December” (*id.* Butt. Ind. 253). Mr. E. Bartlett records it as “very plentiful at times in Sarawak, having the habit of flying along the roads in a direct line, very similar to a Pierine butterfly, for which it may be mistaken.”

#### CYRESTIS TABULA (Plate 307, fig. 2, 2a, ♂).

*Cyrestis Tabula*, de Nicéville, Journ. Asiatic Soc. Bengal, 1883, p. 1, pl. 1, fig. 1, ♂; Butt. of India, etc., ii. p. 253 (1886). Doherty, Journ. As. Soc. Beng. 1886, p. 258, ♀.

IMAGO.—Male. “Upperside rich deep ochreous with black markings; veins mostly defined with black. *Forewing* with a short longitudinal streak at base of the cell, immediately beyond this a transverse one reaching from the median veinlet to the costa; then a pair of streaks which are wide apart at the median veinlet, but



joined on the subcostal veinlet; the discocellular veinlets defined with a fine black line; beyond which is a bow-shaped figure composed of two fine lines joined at their lower ends, the outer line straight, the inner one curved, with their points resting on the second median veinlet and subcostal veinlet; below the cell a pair of streaks reaching the posterior margin, the origin of the first one being where the first median, and the outer one where the second median veinlet is given off, the interspace being thickly irrorated with black scales, leaving but little of the ochreous ground-colour visible; two transverse discal black lines from the subcostal to posterior margin, the outer line lunulate, the inner one sinuate, the two lines being nearest together at their middle, and both inwardly edged with black scales; a submarginal series of seven bright ochreous spots, broadly inwardly defined with black, one in each interspace except the two lower, which are smaller and placed between the lower median and submedian vein; the outer margin broadly black, bearing two obsolete paler lines. *Hindwing* crossed by four black lines, the space between each pair, and between both pairs being thickly irrorated with black scales, especially at the lower extremity of the outer pair, where the ground-colour is entirely black, at the upper extremity the ground-colour increasingly to the costa is very pale ochreous; a submarginal line composed of six lunules, each lunule having a bright ochreous spot placed outwardly against it; the outer margin more broadly black than in forewing, the black portion ending at the lower median veinlet, bearing two intensely black marginal lines, the outer line defined on both sides with a pale fine line, the outer of these two pale lines becoming almost pure white from the tail to anal lobe; the lobe and a round spot above it, is bright ochreous, defined, especially outwardly, with black; there are also some small white, black, and metallic steel-blue markings above the round ochreous-spot; tail black, the tip white. Underside pale ochreous, the outer portion of the wings, and on either side of the submarginal lunules on the hindwing, somewhat deeper ochreous, becoming ferruginous at the anal angle. All the markings of the upperside, but narrower and better defined, with no black irrorations, the outer margins, except the extreme edge, which is black, concolourous with the rest of the wings; the veins throughout pale ochreous. *Body* rich ochreous above, marked with three black lines, beneath pale ochreous; antennæ black, the tip ochreous" (*de Nicéville l.c.*).

Female. "Differs from the male in being white below instead of pale orange-ochreous; above it is only slightly tinged with ferruginous, and is somewhat like *C. Thyodamas*, except that the lighter spaces are heavily clouded with grey" (*Doherty, l.c.*).

Expanse,  $2\frac{2}{10}$  to  $2\frac{5}{10}$  inches.

HABITAT.—Great Nicobar.

NOTE.—"It is somewhat variable, the type specimen is very much darker than

others subsequently received ; in the former alone is the black irroration between the common discal lines of the upperside of both wings present " (*de N. l.c.*).

DISTRIBUTION.—"This species seems to be confined to the island of Great Nicobar, where the late Mr. F. de Roepstorff and Mr. E. H. Man have each obtained two males. Mr. Doherty also obtained both male and female at Great Nicobar, who states that the female, when flying, resembles the white *C. Thyodamas*, for which he at first mistook it" (*l.c.*).

Our illustrations of this species on Plate 307 are reproduced from Mr. de Nicéville's figures.

INDO-MALAYAN SPECIES.—*Cyrestis Nirca* (Amathusia Nivea, Zinken-Sommer, Nova Acta Acad. N. C. 1831, p. 138, pl. 14, fig. 1, ♂. *Habitat.* Java.—*Cyrestis Lutea* (Amath. lutea, Zink. Som. *l.c.* p. 140, pl. 14, fig. 2, ♂ (1831). *Habitat.* Java.—*Cyrestis Fadorensis*, Kheil, Rhop. Nias, p. 22, pl. 3, fig. 2 (1884). *Habitat.* Nias Island.—*Cyrestis superbus*, Staudinger, Deuts. Ent. Zeit. Lep. 1889, p. 53. *Habitat.* Palawan.—*Cyrestis Mænalis*, Erichson, Nov. Act. Ac. N. C. (1834), p. 402, pl. 50, fig. 3. Semper, Reis. Phil. Lep. p. 113, pl. 21, fig. 3, 4, ♂ (1888). *Habitat.* Philippines.—*Cyrestis Irmæ*, Forbes, Nat. Wanderings, p. 274 (1885). Waterhouse, Aid, 11, pl. 176, fig. 2. de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 358. *Syn.* *Cyrestis Sumatrensis*, Staudinger, Exot. Schmett. p. 133 (1888). *Habitat.* Sumatra ; Malay Peninsula.—*Cyrestis obscurior*, Staudinger, D. Ent. Zeit. Lep. 1889, p. 53. *Habitat.* Philippines.—*Cyrestis seminigra*, Grosse-Smith, Ann. Nat. Hist. 1889, p. 313. Pryer and Cator, Brit. N. Borneo Herald, 1894, p. 260. *Habitat.* N. Borneo.—*Cyrestis Theresæ*, de Nicéville, Journ. As. Soc. Bengal, 1894, p. 18, pl. 5, fig. 8, ♂. *Habitat.* N.E. Sumatra.

#### Genus CHERSONESIA.

*Chersonesia*, Distant, Rhop. Malayana, p. 142 (1883). Semper, Reisen Phil. Lep. p. 111 (1888).

*Cyrestis* (sect. 2), Felder, N. Lep. p. 24 (1861).

*Cyrestis* (part), Westwood. de Nicéville.

IMAGO.—Wings small, short. Male. *Forewing* triangular ; costa arched, apex obtuse, exterior margin slightly oblique, nearly straight and even ; first subcostal branch emitted at one-fifth before end of the cell, second at about one-third beyond the cell ; upper discocellular extremely short, middle slightly concave, lower recurved and extremely slender, joining the median at some distance before its middle branch. *Hindwing* broad ; apex oblique and almost rounded ; exterior margin uneven, angled at end of upper median and slightly lobate before anal angle ; precostal vein short, very slender, starting from the costal at some distance above base of subcostal ; upper discocellular at a short distance beyond base of

subcostal branch, lower discocellular extremely slender, outwardly oblique; two upper medians from end of cell. *Body* slender; palpi slender, flattened, smoothly scaled, laxly hairy at base and apex of second joint above, second joint curved upward, third joint projected forward; antennal club robust; eyes naked.

TYPE.—C. Rahria.

LARVA.—Cylindrical, smooth, with two straight fleshy filaments projecting forward from the head, a single backward-curved dorsal filament on fifth segment, and a similar one on the twelfth or last segment. Colour pale green, with a dorsal pale pinkish band.

PUPA.—Tapering from the end, thorax obtusely angled above; with a medio-dorsal biangulated process; head-piece with two curved projected processes. Colour pale green, dorsal and frontal processes brown. (Described from Hagen's figure (Iris, 1896, pl. 1.)

HABITS OF IMAGO.—Mr. de Nicéville states that "all the species of *Chersonesia*, in Sumatra, occur only in forests, and, unlike true *Cyrestis*, never go to roads or moist places, but keep to low bushes, and rest on the underside of the leaves. They fly weakly, and are easily captured" (J. A. S. Bengal, 1895, 432). The late Mr. W. S. Atkinson, in his MS. Notes, says that *C. Risa* "settles on the underside of leaves with the wings distended."

**CHERSONESIA RISA** (Plate 307, fig. 3, 3a, b, ♂ ♀).

*Cyrestis Risa*, Doubleday and Westwood, Gen. D. Lep. ii. p. 262, pl. 32, fig. 4 (1850). Moore, P. Z. S. 1878, p. 829. de Nicéville, Butt. of India, etc., ii. p. 256 (1886).

*Chersonesia Risa*, Distant, Rhop. Malay. p. 142 (1883). Doherty, J. As. Soc. Bengal, 1886, p. 122.

IMAGO.—Male. Upperside rich ochreous or yellowish-ochreous. Both wings crossed by a basal pair of fine black straight lines, the space within irrorated with black scales; another pair beyond; two similar discal lines, the outer one of which has a series of more or less pale ochreous-yellow triangular patches along its inner edge, these patches being most prominent on the hindwing, followed by a steel-blue line which is somewhat macular and less defined on the forewing, where it is divided in the middle by a more or less pale ochreous-yellow patch and other smaller anterior patches on a dusky-speckled ground; beyond is a submarginal fine black wavy line and a straight marginal line. *Forewing* also with a basal-costal black line, and two discocellular fine black lines. *Hindwing* also with a single discocellular fine black line, two outer discal and submarginal lines sinuously bent inward at their lower ends, and with two small black central dots above anal lobe; marginal line inwardly-edged with violaceous-white from the anal angle. Underside paler, markings

similar to above, less defined, the spaces between the transverse lines palest and faintly tinged with violaceous-white.

Female. Upper and underside as in male. *Body* ochreous, with a dorsal and lateral black line; palpi and legs ochreous; antennæ black, annulated with white beneath.

Expanse, ♂ ♀  $1\frac{5}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Kumaon; Nepal; Sikkim; Bhotan; Assam; Silhet; Burma; Upper Tenasserim.

DISTRIBUTION.—Mr. W. Doherty records it from the "Kali Valley, 2000 to 3000 feet elevation, in Kumaon" (J. A. S. Beng. 1886, 122). It is "a common species in Sikkim at low elevations, and occurs to the Eastward as far as Sibsagar, in Assam" (de Nicéville, l.c.). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 289). Mr. W. S. Atkinson says it "settles on the underside of leaves with the wings distended" (MS. Notes). Col. C. H. E. Adamson obtained it in the "Moulmein District, but not common; one specimen also taken in Upper Burma in February" (List Burm. Butt. 26, 1896). Col. Adamson also has a male taken at Pyin Myoung, Shan Hills, in July. It is recorded from "Moulmein to Meetan, and Moolai 3000 to 6000 feet, in December" (P. Z. S. 1878, 829). Mr. W. Doherty obtained it in "East Pegu at low elevations" (P. Z. S. 1891, 283). Mr. P. Crowley has a male from the Karen Hills, Burma.

**CHERSONESIA RAHRIOIDES** (Plate 307, fig. 4, 4a, ♂ ♀).

IMAGO.—Male. Upper side reddish-ochreous. *Forewing* crossed by two sub-basal and two inner-discal slender black lines, which are equidistant one from the other and are very slightly excurved, followed by a medial-discal slender straight, dusky fascia, an outer-discal black recurved line, and then by two submarginal almost straight lines; between the outer-discal and inner submarginal line are two subapical and two posterior short black slender linear streaks, the lowest of the latter being broken and less linear; within the cell is a short black very fine line contiguous and parallel to the inner subbasal line, a similar oblique line beyond the second subbasal line, and two similar short lines bordering the discocellular veinlets. *Hindwing* crossed by two subbasal and two medial-discal equidistant slender black straight lines, a medial-discal slender straight dusky fascia; an outer-discal and an inner submarginal slender black line centred with a linear row of fine slender black short streaks, the two latter outer lines being joined at the lower median veinlet and ending in a double black-speckled ringlet centred with two short black streaks above the anal angle; outer submarginal line extremely slender, being black-and-yellow speckled, and ending in two blue lunules above the anal lobes, these two lunules

having their outer edge and adjacent cilia of the lobes conspicuously black; outer marginal angle at end of upper median and its cilia also black. Underside yellowish-ochreous; markings similar, the outer lines being less distinct. *Body* and palpi above reddish-ochreous; thorax and abdomen with a slender black dorsal line; body beneath and legs yellowish-ochreous; antennæ blackish, shaft annulated with white.

**Female.** Upperside paler ochreous, the interspace between the subbasal and medial, and of the discal and outer marginal lines being yellowish-ochreous; all the markings less defined.

Expanse, ♂ ♀  $1\frac{2}{10}$  to  $1\frac{6}{10}$  inch.

**HABITAT.**—Burma; Upper Tenasserim.

**NOTE.**—From specimens of equal size, of the Malayan, Sumatran, Nias, Borneo, and Java *C. Rahria*, the Burmese examples differ from all, on both the forewing and hindwing, in the two inner-pair of transverse lines being nearer together, and therefore comparatively more equidistant apart; the discal transverse fascia is more slender and straighter, the discal interspace between the lines narrower, the two outer-discal lines are also wider apart, straighter, and less catenulous on the hindwing, and the short central streaks more slender. On the hindwing the two anal black lobe-marks, and of the marginal angle (as described above), is not present in any specimen examined from the other-named localities.

**DISTRIBUTION.**—Col. C. H. E. Adamson has specimens taken at Pyin Myoung, Shan Hills, in July, Kathapa in February, and "Burma" in November. Dr. N. Manders took it in "Eastern Karenee" (Tr. Ent. Soc. 1890, 525). It also occurs in Upper Tenasserim.

#### CHERSONESIA PERAKA.

*Chersonesia Peraka*, Distant, Ann. Nat. Hist. 1884, p. 199; Rhop. Malayana, p. 443, pl. 40, fig. 6 (1886).

**IMAGO.**—"Male and female. Smaller than *C. Rahria*; the ground-colour more ochreous and less rufous; markings similar, but with the transverse fasciæ broader, much darker, and placed close together. The obsolete caudate prolongations in *C. Rahria* near the apices of the third and first median veinlets are scarcely visible in *Peraka*, and the structural peculiarity exists in the first subcostal nervule of the forewing, which, in this species, impinges near its base on the costal nervure. The female has the ground-colour paler than in the male, the wings broader, and the apex of the forewing more rounded."

Expanse, ♂  $1\frac{1}{10}$ , ♀  $1\frac{3}{10}$  inch.

**HABITAT.**—Tenasserim; Malay Peninsula.

**DISTRIBUTION.**—Mr. de Nicéville records specimens, in his own collection, from the Dounat Range, Tenasserim, Perak, Malay Peninsula, and N.E. Sumatra (J. A. S.

Bengal, 1895, 431). Specimens from Sarawak, Borneo, are in the British Museum.

MALAY SPECIES.—*Chersonesia Rahria* (Cyrestis Rahria, Moore, Catal. Lep. E. I. C. i. p. 147, pl. 3a, fig. 2, ♀ (1857). Distant, Rhop. Malay. p. 142, pl. 12, fig. 4, ♀ (1883). de Nicéville, Butt. India, ii. p. 256 (1886). Hagen, Deuts. Ent. Zeit. Iris, 1896, p. 178, pl. 1, fig. 4, 5, larva and pupa. Staudinger, Exot. Schmett. p. 133, pl. 45. *Habitat.* Java; Sumatra; Nias; Malay Peninsula; Borneo.—*C. intermedia*, Martin, Ein. Tagschmett. N.E. Sumatra, pt. 2, p. 4 (1895). *Habitat.* N.E. Sumatra.—*C. Neella*, Swinhoe, Ann. Nat. Hist. 1894, p. 430. *Habitat.* N. Borneo.—*C. Cyaneæ*, de Nicéville, Journ. Bombay, N. H. Soc. 1893, p. 49, pl. L, fig. 6, 7, ♂ ♀. *Habitat.* N.E. Sumatra.—*C. Nicévillei*, Martin, Ein. Tagschmett. N.E. Sumatra, p. 4 (1895). de Nicéville, J. A. S. Bengal, 1895, p. 431. *Habitat.* N.E. Sumatra.—*C. Celebensis*, Rothschild, Dresden Iris, 1892, p. 436. *Habitat.* Celebes.—*C. Mangolina*, Fruhstorfer, Berl. Ent. Zeit. 1899, p. 87. *Habitat.* Sula Mangol, S. Celebes.

### Genus APSITHRA.

*Forewing* with the costa more convex than in typical *Cyrestis*, apex obtuse, exterior margin slightly angulate below the apex and not excavated above the posterior angle. *Hindwing* shorter and broader posteriorly, apex obtusely rounded, exterior margin convex, tail and anal lobes less produced.

TYPE.—A. Cocles.

#### APSITHRA COCLES (Plate 308, fig. 1, 1a, b, ♂ ♀ (*Wet-season form*)).

*Papilio Cocles*, Fabricius, Mant. Ins. ii. p. 7 (1787); Ent. Syst. iii. i. p. 65 (1793).

*Cyrestis Cocles*, Westwood, Gen. D. Lep. p. 260 (1850). Butler, Catal. Fabr. Lep. B. M. p. 82 (1869).

Moore, P. Z. S. 1878, p. 829. de Nicéville, Butt. of India, etc., ii. p. 254.

*Cyrestis Formosa*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 246. Distant, Rhop. Malay. p. 442, ♂ (*wood-cut*).

*Cyrestis Horatius*, Wood-Mason and de Nicéville, Proc. As. Soc. Bengal, 1881, p. 142 ♂.

*Cyrestis Earlei*, Distant, Rhop. Malay. p. 141, pl. 13, fig. 5, ♂ (1883).

*Cyrestis Natta*, Swinhoe, Annals of Nat. Hist. (1899), p. 105, ♂.

IMAGO.—Male and female. Upperside. Both wings with a medial-discal transverse white band, the basal half of the wings and the broad outer border being more or less of a pale greyish sepia-brown. Cilia white; abdominal border greyish-white. *Forewing* with the inner edge of the discal white band very irregularly angulated, its outer edge generally nearly straight and even, but in some specimens slightly sinuous anteriorly; basal half crossed by a more or less dark ochreous sepia-brown

subbasal narrow broken fascia, bordered outwardly by a parallel pale fine whitish line edged by a blackish line; a similar dark ochreous sepia-brown broken fascia forming the irregular angulated edge of the white discal band, inwardly bordered by a white and black line; a short similar-coloured narrow streak, with its inner white and black line inwards, crossing base of cell; another, with the inner white and black edge lines on both its sides, a little beyond, and an angulated more sharply-defined one bordering the discocellulars; outer marginal clouded border traversed by a row of ill-defined bluish-grey ocelli, each with a slight black centre and pale outer ring, the one between the lower and middle median being much the largest, the one above it more or less obsolete, and all bordered by an inner and an outer ill-defined more or less whitish lunular line, beyond which is a sharply-defined marginal fine black line edged on both sides by a white line. *Hindwing* with the white discal band tapering to a point posteriorly and there bent inward above the anal angle, its inner edge undulated and its outer edge even; basal area crossed by a more or less dark ochreous sepia-brown subbasal fascia with an outer fine white and black edge-line, and a similar fascia with inner white and black irregular lines forming the undulated border of the discal white band; a short sharply-defined narrow angulated streak with its white and black line inwards, bordering the discocellulars; outer marginal clouded-border traversed by a row of ill-defined bluish-grey lunules, each with a slight black centre and pale outer edge, the one between the subcostals much the largest and ocellate, and all bordered by an inner and an outer ill-defined whitish lunular line; beyond which is a sharply-defined marginal fine black line edged on both sides by a white line; two similar diffused ocelli at anal angle inwardly bordered by an ochreous patch. Underside white, with a very delicate pale-pinkish flush, and the basal half slightly tinted with very pale grey; the basal and marginal transverse markings, as above, pale sepia-brown and partly obliterated, but the marginal ocelli and anal lobe-spot more prominent. *Body* and palpi above sepia-brown, below and legs white; antennæ brown, annulated with white beneath.

Expanse, ♂ ♀ 2 to 2 $\frac{4}{10}$  inches.

Plate 308, fig. 1, c, d, e, ♂ ♀ (*Dry-season form*).

*Papilio Cocles*, Donovan, Ins. India, pl. 23, fig. 2 (1800), ♂.

*Cyrestis Formosa*, Felder, Reise Novara Lep. iii. p. 412 (1867). Staudinger, Exot. Schmett. p. 133, pl. 45, ♀ (1888).

*Cyrestis Cocles*, var. *Andamanica*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal (1881), p. 246.

*Cyrestis Cocles*, Distant, Rhop. Malay. p. 442, pl. 41, fig. 13, ♂. de Nicéville, Butt. India, ii. pl. 23, fig. 107, ♂.

Male and female. Upperside. Differs from the wet-season form in having the

ground-colour creamy-white, the basal and marginal area very pale yellowish-ochreous, or pale greyish-ochreous, the basal area being also delicately tinted more or less with very pale olive-green; basal and marginal markings as in wet-season form, but more or less indistinctly-defined, and all of a pale ochreous, variable in shades of intensity in certain specimens, and defined with whiter borders. Underside white with a delicate pinkish flush; markings as above, pale ochreous, but more or less ill-defined; marginal ocelli and anal spot black.

Expanse, ♂ ♀ 2 to  $2\frac{6}{10}$  inches.

HABITAT.—Sikkim; Bhotan; Khasias; Silhet; Orissa; Burma; Siam; Tenasserim; Andamans; Malay Peninsula.

DISTRIBUTION.—“Extremely rare in Sikkim, which is probably the westernmost limit of its range; single specimens have been taken at Singla and Sivoke, at low elevations in the spring and autumn. The difference in coloration observed in this species may be due to seasonal causes. Mr. G. C. Dudgeon has observed that the green form occurs in March and the brown form from August to September” (de Nicéville, Sikkim Gaz. (1894), 146). We possess a pale-coloured male of the brown form from Bhotan, taken by Mr. Dudgeon. Mr. de Nicéville records specimens of both the white and brown forms from Khurda in Orissa, Tenasserim, Andamans, and Perak (Butt. Ind. ii. 254). Numerous specimens of both forms have been received by Col. C. Swinhoe from the Khasias. The type specimen is recorded, by Fabricius, from Siam, and is still in the Banksian Cabinet in the British Museum. Mr. P. Crowley possesses a male of the brown form identical with the type, also from Siam, and a pale-coloured male of the brown form from Shillong. Col. C. H. E. Adamson obtained the pale form “near Moulmein, on the Hlinebwe River; but rare; in August and February” (List, 1897, 26), and says, *in epistola*, “that when flying it may be mistaken for *Junonia Atlites*, which was exceedingly common at the same place.” Dr. N. Manders obtained the pale form in Eastern Karenee, Burma (Tr. Ent. Soc. 1890, 525). A male and female of both forms from the Andamans and Perak are in Mr. P. Crowley’s collection. A female of the pale form from Salanga Island is in the British Museum. We possess a female of the pale form from Hainan. In the numerous specimens of both the wet and dry-season forms we have under examination we observe various degrees of shades in the intensity of the colour of the basal and marginal area and markings, which evidently show a gradational mergence from one form to the other.

Of our illustrations of this species on Plate 308, figs. 1, 1a, b represent a male and female of the *wet-season* form from the Khasia Hills, identical with the Fabrician type of *Cocles* in the British Museum, and figs. 1c, d, e, a male and female of the *dry-season* form; fig. 1c, being a Burmese male, and fig. 1d, e, an Andaman female.



**APSITHRA PERIANDER** (Plate 308, fig. 2, 2a, ♂ ♀).

*Papilio Periander*, Fabricius, Mant. Ins. ii. p. 9 (1787); Ent. Syst. iii. i. p. 67 (1793). Donovan, Ins. India, pl. 37, fig. 1 (1800).

*Cyrestis Periander*, Westwood, Gen. D. Lep. p. 261 (1850). Butler, Catal. Fabr. Lep. B. M. p. 82 (1869). de Nicéville, Butt of India, etc., ii. p. 255 (1886). Distant, Rhop. Malay. p. 443, pl. 41, fig. 10.

*Cyrestis Themire*, Honrath, Berl. Ent. Zeit. 1884, p. 398, pl. 10, fig. 5. Moore, Journ. Linn. Soc. Zool. 1886, p. 35.

*Cyrestis Wernickei*, Staudinger, Exot. Schmett. p. 133 (1888).

IMAGO.—Male and female. Upperside white; basal interspaces, to the medial band, sullied with pale fuliginous-grey scales. *Forewing* crossed by a subbasal, a medial, and a discal narrow pale dull ochreous somewhat irregular band; a short similar coloured streak across base of the cell, another across its middle, and one beyond the discocellulars ending on the middle median veinlet; a broad fuliginous-grey outer marginal band, widest anteriorly, its inner edge obtusely angulated inward below the apex and irregularly waved hindward, bearing a submarginal fine whitish lunular line marked within by a series of obscure small black round spots, followed by a marginal fine black line defined on each side by an equally fine white line; the costal border slightly fuliginous-grey. *Hindwing* crossed by three narrow pale brighter ochreous bands and a lower outer-discal broad bright ochreous irregular band, extending from above the median to above anal angle; a short ochreous streak across end of the cell; a narrow fuliginous-grey outer marginal band bearing a submarginal slender black and white parallel scalloped line, marked within by a series of black lunate spots which are narrowly surrounded by white; the black spot above anal lobe being diffusely speckled; beyond is a marginal slender black line defined on each side by an equally fine white line. Underside marked as above, but all the inner bands slightly narrower and less distinct. *Body*, palpi, and legs white; antennæ brown, annulated with white beneath, tip ochreous.

Expanse, ♂ ♀  $1\frac{5}{10}$  to  $1\frac{9}{10}$  inch.

HABITAT.—Siam; Tenasserim; Malay Peninsula; Penang; Sumatra.

DISTRIBUTION.—The Fabrician type, in the British Museum Collection, is recorded from Siam. An example from Siam is also in Mr. P. Crowley's collection. Capt. C. T. Bingham took it in the Thoungyeen Valley, Upper Tenasserim, in November, and Col. C. H. E. Adamson obtained it in the "Houngtharaw Valley, in December and January," where he says, "it was very plentiful on a particular stream rushing down from a high plateau to the valley" (Note). Dr. J. Anderson took it on King Island in February and on Elphinstone Island, Mergui Archipelago, in March (J. Linn. Soc. Zool. 1886, 35). Mr. W. L. Distant records it from Perak, Malay Peninsula, and Penang.

Of our illustrations of this species on Plate 308, fig. 2 represents a male from Hountharaw, and fig. 2a a female from Siam—identical with the Fabrician type.

INDO-MALAYAN SPECIES.—*Apsithra Sericeus* (Cyr. Sericeus, Butler, P. Z. S. 1865, p. 482. *Habitat*. N. Borneo.—*Apsithra Cassander* (Cyr. Cassander, Felder, Wien. Ent. Monats. 1863, p. 108. Semper, Reis. Phil. Lep. pl. 21, fig. 1, 2. *Habitat*. Phil. Isles.—*Apsithra Horsfieldii* (Pap. Periander, Horsf. Catal. Lep. E. I. C. pl. V, fig. 3, 3a (1829). Male and female. Upperside with the inner transverse bands comparatively broader than in typical *Periander*; the outer marginal band on the forewing not inwardly angulated below the apex, and its inner edge more regular in its course. Underside with the marginal band ill-defined. Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{7}{10}$  inch. *Habitat*. Java.—*Apsithra Dohertyi*. Male and female. Upperside with the transverse bands narrow, but more irregular than in *Horsfieldii* or *Periander*; the outer marginal band on forewing broader and regularly sinuous on its inner edge; the outer marginal band on hindwing also broader, and its inner series of black spots much larger and cordate in shape. Expanse, ♂ ♀  $1\frac{8}{10}$  to 2 inches. *Habitat*. Sambawa (Coll. Crowley and Grose-Smith).

### Genus JUNONIA.

*Junonia*, Hübner, Verz. bek. Schmett. p. 34 (1816). Doubleday and Hewits. Gen. D. Lep. i. p. 206 (1849). Felder, Neues Lep. p. 13 (1861). Moore, Lep. Ceylon, i. p. 40 (1881). de Nicéville, Butt. of India, etc., ii. p. 65 (1886). Seudder, Butt. E. U. S. i. p. 487 (1889). Distant, Rhop. Malay. p. 92 (1883). Staudinger and Schätz, Exot. Schmett. ii. p. 125 (1887).

*Alcyoneis*, Hübner, Verz. bek. Schmett. p. 35 (1816).

*Aresta* (part), Dalm. in Billberg's Enum. Ins. p. 79 (1820).

*Precis*, Moore, Lep. Ceylon, i. p. 39. Distant, Rhop. Malay. p. 89. de Nicéville, Butt. India, etc., ii. p. 63 (*nec* Hübner \*).

IMAGO.—Male. Wings short, broad. *Forewing* triangular; costa much arched from near the base, apex obtuse; exterior margin oblique, slightly uneven, obtusely angulated outward at end of upper radial, slightly concave below the angle and again obtusely angulated at end of lower median, posterior angle rounded; posterior margin nearly straight; costal vein extending to middle of margin; first and second subcostal branches emitted close together a little before end of the cell, third branch at fully one-third beyond the cell and extending to apex, fourth and fifth at two-thirds beyond; cell area short, broad, open; upper discocellular very short and outwardly oblique, second discocellular deeply concave; two upper median branches emitted beyond the opposite discocellulars; submedian vein straight. *Hindwing*

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\* The type of Hübner's genus *Precis* is *Octavia*, Cramer, an African species, in which the cell of the forewing is closed.

with the costa broadly lobate at base and obliquely curved outward; exterior margin obliquely convex, slightly scalloped; anal angle somewhat lobate; precostal vein bent outward and slightly bifid at the angle; costal vein much curved from the base and extending to apex; cell area short, open. *Body* rather stout; palpi porrect, second joint stout, extending half beyond head; third joint short, conically slender, pointed, clothed with laxly appressed scales at sides and beneath, second joint hairy above; forelegs of male rather short, slender, clothed with scales and delicate hairs; forelegs of female smoothly scaled, tarsus flattened at the sides, joints laterally spined at the tip; antennæ slender, with a rather short, stout, somewhat spatulate grooved club; eyes naked.

TYPE.—*J. Lavinia*.

LARVA.—(*Iphita*) "Cylindrical; slightly pubescent; armed with nine longitudinal rows of many-branched spines, except on the head, which is clothed with short bristles. In *J. Iphita* the spines appear to be shorter and more closely set than in the other Indian species. They feed, as a rule, on *Acanthaceæ*."

PUPA.—"Regular, with three, or five, dorsal rows of small tubercular points. Suspended perpendicularly" (*J. Davidson* and *E. H. Aitken*, *J. Bombay N. H. Soc.* 1890, 271).

HABITS, ETC.—"In India the species of *Junonia* occur everywhere up to about 7000 feet elevation, and are generally numerous in individuals. They have a rapid flight, but seldom go far before settling, which they do with expanded wings, often on the bare ground, frequently on flowers. *J. Hierta* and *J. Orithya* delight in the stony beds of dried-up streams in the Hills; in the Plains they chiefly frequent fields and gardens. The sexes are very slightly differentiated" (*L. de Nicéville*, *l.c.* p. 66).

SEASONAL DIMORPHISM.—This occurs to a slight extent in *J. Iphita*, *Atlites*, and *Lemonias*, the wet-season brood of the two former species being distinguishable from the specimens of the dry-season brood, by the brighter and darker ground-colour and more prominent markings of both the upper and underside of the wings, and in the latter species (*Lemonias*) the dry-season specimens are distinguishable from the wet-season by the paler or uniform colour of the whole underside and the absence of the ocelli on the hindwings. In *J. Almanas*, the wet-season brood (*Asterie*) not only differs from the dry-season (*Almanas*) in the ground-colour and markings of the underside, but also—in the regions where the seasons are well separated—in the shape of the marginal outline of both wings.

In *J. Hierta* and *Orithya*, in addition to the difference in the ground-colour and markings on the underside, the females of both species also have the markings of the upperside somewhat different from those of the males.

ABERRATIONS OR "SPORTS."—The butterfly described by *Möschler* as *Junonia*

*Hopfferi*, from Silhet, is evidently an aberration, but without comparison of the type specimen we cannot say to which species it belongs. We describe an aberration of the male of *J. Atlites*, from Cachar, in the possession of Mr. P. Crowley. Of *J. Lemonias*, Col. C. H. E. Adamson records a "sport" caught by himself in September, in Burma; and Mr. L. de Nicéville records two specimens of a "sport" of this species, both females, taken in Malda and Orissa, in Bengal.

**JUNONIA IPHITA** (Plate 309, fig. 1, 1a, b, c, d, e, ♂ ♀ (*Wet and Dry-season forms*)).

*Papilio Iphita*, Cramer, Pap. Exot. iii. pl. 209, fig. C.D. (1779). Fabricius, Spec. Ins. ii. p. 86 (1781).

*Precis Iphita*, Doubleday and Hewits. Gen. D. Lep. p. 210 (1849). Moore, Lep. Ceylon, i. p. 39, pl. 21, fig. 1, 1a, b (1881). Distant, Rhop. Malay. p. 90, pl. 11, fig. 5, ♂, pl. 9, fig. 5, ♀ (1882).

de Nicéville, Butt. of India, etc., ii. p. 63, pl. 19, fig. 84, ♂ (1886). Leech, Butt. of China, etc., i. p. 276 (1893).

*Junonia Iphita*, Butler, Catal. Fabr. Lep. B. M. p. 76 (1869).

IMAGO.—*Wet-season form*. Male and female. Upperside olivescence-brown; cilia slightly edged alternately with white. Both wings with the basal half darker brown, the divisional border across the disc more intensely defined and blackish, being also angulated outward from the costa of forewing to the upper median, and thence slightly waved posteriorly and more evenly across the hindwing; a dark outer-discal fascia traversed on the forewing by two, or three, very obscure or obsolescent small ocellated spots situated in the median interspaces, and on the hindwing by a series of five somewhat more distinct similar ocellate spots; followed by a submarginal and marginal dark lunular line; all these spots being less defined in the female. *Forewing* also with two slender sinuous black lines across middle of the cell, two similar discocellular lines, and a white subcostal dot before the apex. *Hindwing* also with two similar discocellular lines. Underside dark purplish-brown washed with chalybeate-grey between the markings. *Forewing* crossed by a basal, subbasal, and two medial, more or less-defined, darker purplish-brown sinuous-edged fasciæ; followed by a submarginal similar diffused decreasing fascia, which is outwardly-bordered by a recurved series of, more or less apparent, small obscure ocellate spots with white centres, and beyond by two obscure outer marginal sinuous lines. *Hindwing* crossed by a subbasal broad irregular sinuous purplish-brown fascia, a medial fascia which is diffused and bordered outwardly by a series of more or less obscure small yellowish-ochreous ocellate spots with white central dot, and bordered inwardly by a nearly straight black line edged by an obscure yellowish-ochreous line, and sometimes showing a pale yellowish patch at its costal end; followed by an inner marginal black sinuous line edged with grey. *Body* and palpi,

and legs, olivescence-brown, palest beneath, antennæ black above, pale ochreous beneath.

*Dry-season form.* Male and female. Upperside darker olivescence-brown, markings the same; the series of ocelli on the hindwing more prominent, and more or less ochreous-ringed, most distinctly so in the female. Underside the same.

Expanse, ♂ 2 to 2 $\frac{1}{10}$ , ♀ 2 $\frac{1}{10}$  to 3 inches.

LARVA.—Cylindrical; dark brown; head reddish-ochreous; segments with dorsal and lateral rows of short delicate branched-spines. Feeds on *Strobilanthus*.

PUPA.—Short; pale purplish-grey or fuliginous; with dorsal rows of small tubercular points; thorax broad; head-piece pointed in front.

HABITAT.—India; Ceylon; Burma; Tenasserim; Malay Peninsula; Sumatra; W. and C. China.

DISTRIBUTION AND HABITS.—“This is an exceedingly common species, as a rule, where it occurs; it has a somewhat bold flight, but not for any great distance, it often, but not always, pitches on the ground, frequently on bushes. It occurs throughout the Himalayas, in Assam, Silhet, Cachar, Burma, rarely in Calcutta, but commonly in the Wynaad, Nilgiris, and Ceylon. In the plains of Upper India it is seldom found, and never in the drier parts” (de Nicéville, Butt. India, ii. 64). It is also found in Tenasserim, the Malay Peninsula, and Sumatra. In the W. Himalayas it is “common all the summer and autumn in the beds of streams, and occasionally met with on Hill-tops far away from any water” (de Nicéville, Indian Agriculturist, 1880). “Taken at Simla, Masuri, and Kashmir, June to October” (Capt. H. B. Hellard, Notes). “In Kumaon it is everywhere common, as high up as Khati, 8000 feet elevation. The *wet-season* brood consists of very pale specimens; the autumn brood, appearing at the end of September, is much darker” (W. Doherty, J. A. S. Bengal, 1886, 123). “In the Bombay Presidency this butterfly is very plentiful after the rains, and especially among the thorny jungle which covers the little Hills of the Konkan. It is also one of the most familiar species of the Ghâts. I have never seen specimens here so large as some which come from the Himalayas. It has all the habits of a *Junonia*, and its colour seems inappropriate, for it lives in the midst of green foliage, and rarely settles on the ground” (E. T. Aitken, J. Bombay N. H. S. 1895, 406). “In the larva of *Iphita* the spines seem to be shorter and more closely set than in other *Junonias*, the colour is dark dull brown. It feeds on the Karvi (*Strobilanthus*) and doubtless occurs more or less throughout the year. We found few larvæ, for though the butterfly is the commonest in Karwar, the plant is still commoner, an unfavourable condition for the larva hunter” (J. Davidson and E. T. Aitken, *id.* 1890, 271). “Very common in the low country of Travancore, and in the Hills up to 3000 feet elevation” (H. S. Ferguson, Journ. Bombay N. H. S. 1891, 8). “This is one of the commonest butterflies occurring in

Sikkim, and is found up to about 8000 feet elevation almost throughout the year. The larva, in Sikkim, feeds on a species of *Strobilanthus*" (L. de Nicéville, Sikk. Gaz. 1894, 135). Col. C. H. E. Adamson records it as being found "throughout Burma" (List, 1897, p. 18). Dr. J. Anderson took it in the Mergui Archipelago in November, December, January, and March (Journ. Linn. Soc. Zool. 1886, 35). We possess specimens from Western China.

FOOD-PLANT OF LARVA.—"The larva feeds on the Karvi, *Strobilanthus callosus*, at Karwar, Bombay" (Davidson and Aitken, J. Bombay N. H. S. 1890, 71).

### JUNONIA HOPFFERI.

*Precis Hopfferi*, Möschler, Stett. Ent. Zeit. 1872, p. 337, ♀.

*Junonia Hopfferi*, de Nicéville, Butt. India, etc., ii. p. 71 (1886).

"The shape of the forewing resembles that of *Precis Erigone*, but the hindwing is not angled as in several species of the genus. The ground-colour of both wings on the upperside is of a clear golden-brown, as in many females of *P. Iphita*, Cram. [*ida*, Cram.], but is shaded by a dark brown dusting, so that it [the ground-colour] only appears in a triangular spot at the base of the discoidal cell, in a narrow transverse spot at end of the cell, in a narrow band behind the transverse series of dark spots which crosses the middle of the wings, and in a broader band in front of the margin. In the discoidal cell in front of the middle are two obliquely-placed round dark brown spots with clear golden-brown centres; behind these is a large misshapen kidney-like spot surrounded with black. In the middle of the wings the dark dusting is bounded by a series of dark brown transverse spots which enter angularly into the fourth cell. In front of the light margin is placed a series of black-brown round spots, of which the three upper ones in the fifth, sixth, and eighth cells are only brown on the innerside, being otherwise white, and of these the spot in the fifth cell approaches the margin, thereby dropping out of the line of the others; the lowest spot in the second cell is the largest, and surrounded with a fine golden-brown. Behind these spots runs through all the cells a series of broad lunular spots, and behind them this again runs a dark brown undulating streak following the margin which runs in an angle into the fifth cell. The margin is narrowly black-brown in colour, but marked finely with white externally between the veins. On the underside the colouring is clearer, brownish ochre-gold, the light parts being almost reddish-gold; the spots of the cell are encircled with fine black, the series of dark spots through the middle of the wings lighter brown and less distinct on the margin are bordered with white violet-red spots on the forewing in cells one *b* and two, also in cells five and six, and in the hindwing in all the cells. The dark bands of the

upperside between these spots and the clear margin appear narrower in the forewing, almost resolved into flecks; of the round spots immediately behind these the one in the second cell is black bordered, those in the fourth, fifth, sixth and eighth cells are white bordered, and only the three lowest on the underside are bordered with faint brown, the spot in the third cell is a mere point. On the hindwing this band is still more disintegrated, and of the dark spots only the one in the second cell is visible; it is deep black, on the side towards the margin, with a fine white centre. The series of lunulated spots, as also the undulating streak in front of the margin, is a lighter reddish-brown, the border between the two on the forewing in cells five and one *b*, and the hindwing in all the cells being tinged with pale violet-red. The margin itself is scarcely darker. Two females from Silhet" (*Möschler, l.c.*).

HABITAT.—Silhet.

NOTE.—The above probably refers to an aberration or "sport" of one of the species of this genus.

**JUNONIA ATLITES** (Plate 310, fig. 1, 1a, b, c, d, ♂ ♀; larva and pupa).

*Papilio Atlites*, Linnæus, Cent. Ins. p. 24 (1763). Johanssen, Amæn. Acad. vi. p. 407 (1764). Linn. Mus. Ulr. p. 273 (1764).

*Junonia Atlites*, Kirby, Trans. Ent. Soc. 1870, p. 145. Aurivillius, Kongl. S. V. Akad. Handl. xix. p. 79 (1882). Distant, Rhop. Malay. p. 93, pl. 2, fig. 11, 12, ♂ ♀ (1882). de Nicéville, Butt. of India, etc., ii. p. 69 (1886).

*Papilio Laodamia*, Clerck, Icon. Ins. iii. pl. 7, fig. 5 (*ined.*).

*Papilio Laomedea*, Linnæus, Syst. Nat. xii. ed. ii. p. 772 (1767). Drury, Illust. Exot. Ins. i. p. 12, pl. 5, fig. 3 (1770). Cramer, Pap. Exot. i. p. 13, pl. 8, fig. F, G (1775). Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 10 (1776). Herbst, Nat. Schmett. vii. pl. 174, fig. 1, 2 (1794).

*Junonia Laomedea*, Kirby, Catal. D. Lep. p. 187 (1871). Moore, Catal. Lep. Mus. E. I. C. i. p. 140, pl. 5, fig. 4, 4a, larva and pupa (1857). Butler, Catal. Fabr. Lep. B. M. p. 77 (1869).

*Precis Laomedea*, Moore, Lep. Ceylon, i. p. 40, pl. 21, fig. 2 (1881).

IMAGO.—Male. Upperside lilacine brownish-grey, the outer borders greyish-fuliginous. Forewing with two irregular sinuous black lines across middle of the cell, and two similar lines bordering the discocellulars, a transverse discal irregularly-angulated more or less slightly diffused black line, followed by a recurved series of six ocellated spots ringed with white and black, of which the upper two and the fifth are the largest, and are transversely centred inwardly with ochreous-red and outwardly with black, the others with blackish centre; the first ocellus is preceded by a small bifurcated white spot at the base of fourth and fifth subcostals; beyond is a submarginal and marginal somewhat diffused blackish lunular line. Hindwing with two waved black lines crossing end of the cell, a transverse discal waved black

line, followed by a series of five similar ocellated spots, a sixth or lowest spot sometimes also obsolescently present, the two upper and the fifth the largest and with red and black centres; beyond is a submarginal and marginal somewhat diffused blackish lunular line. Underside lilacine ochreous-white, the outer borders slightly tinged with pale ochreous; the basal and outer markings as on upperside, but very slender and faintly defined; the discal line sinuous on the forewing and more or less regularly straight on the hindwing; the two largest particoloured ocelli on both wings slightly defined and paler ochreous, or obsolescent. *Forewing* also with an extra basal faint line across the cell, the other cell lines extending faintly hindward to across cell of the hindwing and partly beyond its median vein.

Female. Upperside darker; the transverse lines somewhat more diffused, the ocellate spots brighter, with the interspaces bordering the discal and submarginal line more or less lunularly whitish, mostly more defined on the forewing. Underside pale dull yellowish or brownish-ochreous, darkest alternately between the markings and on outer borders; markings as in underside of male, but more distinct. *Body* and palpi above fuliginous-grey, beneath and legs greyish-white; antennæ black above, ochreous beneath and outwardly edged with white, tip ochreous.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{8}{10}$  inches.

LARVA.—Cylindrical; armed with a dorsal and lateral rows of branched-spines. Colour fuliginous-black, with a paler subdorsal line, and a sublateral ochreous-brown line; spines black.

PUPA.—Rather stout; purplish-grey; head-piece broadly obtuse in front and slightly cleft; thorax and abdomen with a dorsal row of acute tubercular points and lesser lateral points.

HABITAT.—Plains of Eastern and Peninsular India; Assam; Ceylon; Nicobars; Burma; Tenasserim; Malay Peninsula, etc.

ABERRATION.—A male, from Silchar, Cachar, in Mr. P. Crowley's collection, has the upperside dusky greyish-fuliginous, broadly darkest on the costal border of forewing and anteriorly on the hindwing. Both wings with the ordinary transverse discal sinuous line absent, the two submarginal lines united, and forming an ill-defined submarginal dusky fascia. On the forewing the interspaces of the two pairs of sinuous cell-streaks is fuliginous-grey, the outer-discal transverse row of ordinary ocelli obsolescent and without any indication of ochreous interiors; on the hindwing these ocelli are present but ill-defined, and slightly show the ochreous centres. On the underside the ground-colour is of the ordinary pale lilacine ochreous-white, the discal and outer line slightly indicated, but diffused, the ocelli also very slightly indicated, the basal transverse lines indicated by fuliginous-brown scaled inner and outer interspaces.



DISTRIBUTION.—“This is a very common species, seldom if ever occurring in the Himalayas, or in the very dry portions of India, but abundant in the plains throughout the area of heavy rainfall. Colonel Swinhoe does not record it from Bombay and the Deccan” (de Nicéville, Butt. Ind. ii. 69). We possess specimens from Nepal; Sikkim; Bhotan; Chittagong, taken in November; Yaw, Burma, taken in October; Mandalay; Bhamo, taken in November by Signor L. Fea; Tavoy; Tenasserim; Ceylon; Camorta, Nicobars; Malacca; Sumatra; Nias; Java; Sarawak, Borneo; Hainan. Mr. W. Doherty records it as “scarce at Ranibagh and in the Tarai, Kumaon, from 1000 up to 2000 feet elevation” (J. A. S. Beng. 1886, 123). “It occurs rarely in Sikkim in the hottest valleys, but is common in the Terai at all seasons” (H. J. Elwes, Tr. Ent. Soc. 1888, 342).

“In the Central Provinces this butterfly is always found in and about marshy spots, on the borders of streams and damp places generally. The flight is distinctly slower than any of its relatives, so that there is no difficulty in capturing it” (J. A. Beetham, J. Bombay N. H. S. 1890, 279). “It is fairly common on the Kanara coast about rice-fields, chiefly at the end of the rains. It occurs also above the Ghauts. The larva is coloured more distinctively than the others, being dull smoky black with a well-defined orange-brown stripe above the legs. The pupa is of a uniform slaty colour” (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 249). Colonel C. H. E. Adamson records it as “very common in Lower Burma, but comparatively scarce in the dry parts of Upper Burma” (List, 1897, 19). Dr. J. Anderson found it “very common in Mergui, Tenasserim, in December, January, February, and March” (J. Linn. Soc. Zool. 1886, 35). Mr. H. Druce records it from “Chentaboon and Nakonchaisee, Siam” (P. Z. S. 1874, 105). Mr. J. J. Walker states having “seen one or two specimens in local collections in Hong Kong, said to have been taken there, but did not meet with it himself” (Tr. Ent. Soc. 1895, 453).

**JUNONIA ORITHYA** (Plate 311, fig. 1, 1a, b, c, d, e, ♂ ♀; larva and pupa).

- Papilio Orithya*, Linnæus, Syst. Nat. ed. x. p. 473 (1758); *id.* ed. xii. p. 770 (1767). Cramer, Pap. Exot. i. pl. 19, fig. C, D, ♀, pl. 32, fig. E, F, ♂ (1775); *id.* iv. pl. 290, fig. A, B, ♂ (1780). Herbst, Nat. Schmett. pl. 177, fig. 5, 6, 7, ♂ ♀ (1794). Donovan, Ins. China, p. 64, pl. 35, fig. 2, ♀ (1842).
- Vanessa Orithya*, Lucas, Lep. Exot. p. 113, p. 60, fig. 1 (1845).
- Junonia Orithya*, Hübner, Verz. p. 34 (1816). Butler, Catal. Fabr. Lep. B. M. p. 73 (1869). Moore, Lep. Ceylon, i. p. 41, pl. 22, fig. 1, 1a, b, ♂ ♀, larva and pupa (1881).
- Junonia Orithya*, Doubleday and Hewits, Gen. D. Lep. i. p. 209 (1849). Moore, Catal. Lep. Mus. E. I. C. i. p. 141, pl. 5, fig. 5, 5a (1857). Forsayeth, Trans. Ent. Soc. 1884, p. 382. Butler, Ann. Nat. Hist. 1885, p. 308. de Nicéville, Butt. India, etc., ii. p. 73 (1886).

*Junonia Ocyale et Isocratia*, Hübner, Verz. p. 34 (1816).

*Junonia Swinhoei*, Butler, Ann. Nat. Hist. 1885, p. 309.

IMAGO.—Male. Upperside. *Forewing* with the costal border whitish-edged, cilia alternately pale brown and white; the basal two-thirds dark blue-black, the outer area fuliginous-black; an ochreous-white oblique subapical short angulated band and two transverse submarginal lunular fasciæ, the inner fascia broadest, shortest, and bearing an upper and a lower small black red-ringed ocellus, with a blue-speckled central dot, below which the posterior area is dark blue; crossing end of the cell are two short very obsolescent blue-scaled bars. *Hindwing* dark blue suffused with purple; a basal short narrow black angular patch which curves upward across end of the cell, and merges into brown on the abdominal margin; two outer-discal prominent ocelli, which in some specimens are of equal size, in others the upper one is the largest, and is either entirely black and blind, or obsolescently red-ringed, the lower one being bright red-ringed, with blue and black speckled centre; beyond are two submarginal pale-bordered slender black lunular lines; cilia mostly white. Underside pale dull greyish-ochreous. *Forewing* with three basal transverse reddish-ochreous bands sinuously edged with black, a discal sinuous fascia inwardly edging the subapical band, followed by the pale less-defined outer marginal lunular fasciæ and the two blind ocelli, as on upperside. *Hindwing* crossed by narrow more or less faintly-defined brown sinuous basal and marginal lines, and a diffused brownish discal fascia bearing a series of small very palely-defined or obsolescent ocelli.

Female. Upperside. *Forewing* with the basal and outer margin browner black, the blue patch duller, and sometimes fuliginous; the white markings somewhat wider, the ocelli larger and more prominent; two more or less obsolescent black-edged reddish bars with intervening bluish bar across end of the cell. *Hindwing* with the basal half entirely black, the blue outer area paler, duller, and sometimes fuliginous; the two ocelli larger, more prominent, and both red-ringed; marginal pale-bordered lines also more defined. Underside darker than male; markings the same, but all more defined. *Body* above black, beneath and legs pale ochreous-white; palpi above brown, white beneath; antennæ white above, beneath ochreous annulated with white, tip beneath brown.

Expanse, ♂  $1\frac{5}{10}$  to 2, ♀  $1\frac{5}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—“Head bifurcated; reddish spot in centre of face, a small spinous process on each upper angle of eye. Head and body dark shining black, shading into brown when seen by reflected light. Head on a short neck, the latter of an orange-colour for a short distance; caudal extremity also tipped with orange. Body covered with perpendicular spines armed with strong radial hairs.”

PUPA.—“Suspended by tail; wing covers of a muddy-yellow; rest of body of

a purplish colour, variegated by lines of a dull creamy-white; slight angular projections along abdomen" (Dr. Forsayeth, *l.c.*).

HABITAT.—India; Ceylon; Burma; China; Hong Kong; Formosa.

DISTRIBUTION, HABITS, ETC.—"This is a common species and appears to occur everywhere in India up to about 6000 feet elevation. It is exceedingly variable on the underside, specimens from the dry north-west being of a pale stone-grey, while examples from Shillong, Assam, have the underside dark brown, richly mottled and shaded with paler brown. On the upperside, too, there are variations in markings, some males show traces of two ochreous bands across the cell of the forewing, which are usually more or less present in the female, in some specimens of the latter sex that feature being very prominent. The ocelli vary greatly in size in both sexes, in some specimens they are fully twice as large as in others. The specimens from Upper Burma, Cachar, and Assam are richly marked on the underside, and are almost identical with the typical *J. Orithya* from China, which Mr. Butler has already shown (Ann. N. H. 1885, 308) to extend to Siam. The Western form with the pale, slightly marked underside, has been separated as a distinct local race as *J. Swinhoei* (Butler, *l.c.*). This variety is fairly constant throughout the dry tracts in the West and North-west, and also in the Western Himalayas, but there is no line of demarcation, and the two forms gradually merge into each other. Specimens from Ceylon and Travancore are nearly as richly marked as those from Cachar; those from Sikkim and Bhotan, and also from the Western Ghâts are less richly marked; and those from the plains of Bengal and the Coromandel coast still less so; the differences as in all parallel cases following the tropical distribution of the rainfall, the colours being most intense where the rainfall is heaviest" (de Nicéville, Butt. Ind. ii. 74). "Found in Kumaon, both in the plains and up to 6000 feet elevation" (W. Doherty, J. A. S. Bengal, 1886, 123). "Generally seen in company with *J. Hierta*; it also closely resembles it in habits and time of appearance. Both are to be met with on the wing in the Hills from March to November" (L. de Nicéville, Indian Agriculturist, January, 1880). "Partial to bare grass land; to be seen in the hottest hot winds, and in the bleak wintry weather, pitched on the grass, flitting quickly away and pitching again after a short circuit. Larva reared on *Antirrhinum*" (Captain A. M. Lang, Notes). Colonel C. Swinhoe records its capture at "Quetta, Beluchistan, in September" (Tr. Ent. Soc. 1885, 339). Colonel J. W. Yerbury took it at "Campbellpore, forty miles from Rawul Pindi, in April, at Attock in April, and at Bugnoter in September. It is probably the commonest butterfly all the year round both at Campbellpore and Murree, but at Thundiani Hill Station, 8700 feet elevation, it is uncommon" (Ann. N. H. 1888, 142). "Commonly found in ditches all the year round in Bombay and the Deccan. I have taken it at Karachi in May" (Colonel C. Swinhoe, P. Z. S. 1885, 128). Dr. Forsayeth

describes the larva, as reared by him in Mhow, in August (Tr. Ent. Soc. 1884, 382). "This butterfly is of similar habits to *J. Hierta* and *J. Lemonias*. They all love the hot sunshine, and this and *J. Hierta* are to be found in the Central Province in the most open and exposed situations; open grass plains being about the most favourite spots" (J. A. Beetham, J. Bombay N. H. S. 1890, 279). "This is *par excellence* the *Junonia* of the Deccan, delighting in dry hills and stony plains. On the bare plateau of Lanowlia I have found it very abundant in company with *J. Hierta*, in February, revelling in the wealth of minute wild flowers which clothe the ground in that favoured spot" (E. H. Aitken, J. Bombay N. H. S. 1886, 131). "This species likes stony plains and bare hills, and is consequently comparatively rare in Kanara, and altogether wanting during the monsoon. It rests always on the ground" (J. Davidson and E. H. Aitken, *id.* 1896, 249). "Very common on the Eastern Coast, and found everywhere. Larva easily observed, as it feeds on the low and slightly aromatic shrubs which grow by the wayside in the Karnatic" (S. N. Ward, MS. Notes). In Ceylon, Mr. F. M. Mackwood records it as "occurring everywhere, but plentiful only from 2000 to 4000 feet elevation; a favourite resort being the Patenas, and particularly on the pathways or bare places in them." Captain Hutchison says it is "found at all times in the Western and Central Provinces, both in the plains and up to 3000 feet, in cultivated and open waste-ground. Flight rather quick; settles on the ground and seems partial to hot dusty and sandy spots. Dr. Thwaites found the larva feeding on *Acanthads*" (Lep. Ceylon, i. p. 42).

"A common insect in Sikkim at elevations up to 9000 or 10,000 feet, but most abundant in cultivated ground and sunny clearings. It settles on the ground with open wings, and has a rapid strong flight. Occurs at all seasons" (H. J. Elwes, Tr. Ent. Soc. 1888, 342). "Common throughout Burma, alike in the hot plains, in the marshes in the South, and the hills in the North and West" (Colonel C. H. E. Adamson, List, 1897, 19).

**JUNONIA HIERTA** (Plate 312, fig. 1, *larva* and *pupa*, fig. 1a, b, c, d, e, ♂ ♀).

*Papilio Hierta*, Fabricius, Ent. Syst. Suppl. p. 424 (1798).

*Junonia Hierta*, Kirby, Syn. Catal. D. Lep. p. 648 (1871). Swinhoe, Proc. Zool. Soc. 1884, p. 505; *id.* 1885, p. 128. de Nicéville, Butt. of India, etc., ii. p. 71, pl. 20, fig. 94, ♂ ♀ (1886).

*Papilio Oenone*, Cramer, Pap. Exot. i. pl. 35, fig. A, B, C, ♂ ♀ (1775). Herbst, Nat. Schmett. vii. p. 163, pl. 178, fig. 1-4 (1794). Donovan, Ins. China, p. 66, pl. 36, fig. 1, ♂ (1798), *nec* Linn.

*Junonia Oenone*, Hübn. Verz. bek. Schmett. p. 34 (1816). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Moore, Lep. Ceylon, i. p. 42, pl. 22, fig. 3, 3a, ♂ ♀ (1881). Forsayeth, Trans. Ent. Soc. 1884, p. 383.

IMAGO.—Male. Upperside dark fuliginous-black; cilia brown, alternated with

white. *Forewing* with a large broad medial ochreous-yellow patch, palest in the middle, extending from near the base more or less irregularly to below the subcostal and obliquely to beyond the disc towards the posterior angle, where it is sometimes narrowed and bent downward, or includes a round black lower-discal spot between the two lower medians and thence joins the upper end below base of the cell; a subapical short white angular streak and a straight upper submarginal duller streak crossed by the veins; a small ochreous-ringed ocellus is generally present below the subapical streak. *Hindwing* with a large cobalt-blue subbasal spot; a large lower-discal broad ochreous-yellow patch extending from the submedian below the cell to the lower subcostal and thence curving downward to near the outer margin and ending above anal angle; the black outer-marginal border being sometimes more or less lunularly-included within the ochreous patch; an ochreous-grey lunule is generally present above the anal angle; abdominal border greyish-brown. Under-side. *Forewing* pale dull yellowish-ochreous; the apex, outer and posterior border being pale ochreous-brown and crossed by the upper whitish fasciæ; the upper and lower discal black ocellate spot distinct; across the cell are five more or less complete black sinuous lines and a diffused streak at its end. *Hindwing* greyish-ochreous, more or less powdered with brown scales; crossed by brown subbasal wavy lines, a discal sinuous fascia, then a row of obsolescent dots of which the lowest is more distinct and ocellate, followed by two submarginal sinuous lines.

Female. Upperside brownish-black. *Forewing* with the ochreous discal area more restricted; middle of the cell crossed by two more or less entire black streaks and a broad streak at its end; apical white fascia, and two discal black ocelli with blue central dot, disposed as in male. *Hindwing* with the lower-discal ochreous patch narrower, and bearing an upper and lower small black ocellus with blue-speckled centre; the outer marginal lunular lines entire and edged with ochreous; the subbasal blue spot smaller, more or less duller, sometimes black speckled and occasionally obsolete. Underside darker than in male; markings the same. *Body* above black, beneath and legs pale ochreous-white; palpi above brown, beneath white; antennæ black above, pale ochreous beneath.

Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{2}{10}$ , ♀  $1\frac{6}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—Cylindrical; minutely hairy; head rather small, vertex bluntly cleft, hairy; segments armed with a dorsal and lateral rows of black branched-spines; ground-colour greyish-fuliginous, dull reddish beneath; with a dorsal pale ochreous line, and lateral rows of white marks.

PUPA.—Dull reddish; head obtuse in front; thorax dorsally convex; abdomen with a dorsal and lateral rows of small blackish points. (Described from Capt. Mortimer Slater's drawing.)

HABITAT.—India; Ceylon; Burma; Tenasserim; Andaman and Nicobar Isles, etc.

DISTRIBUTION, HABITS, ETC.—“This species has a very wide range, occurring at Karachi, thence throughout India, Ceylon and the Andamans to Burma, and again in China. It delights in the sun, and to disport itself in the hottest and driest situations. In India it presents some considerable variation according to the humidity or dryness of the atmospheric conditions under which it exists, but these variations cannot be maintained as distinct species. Some male specimens from Kulu and Simla in the Western Himalayas, Sikkim, Calcutta, Orissa, the Wynaad, and Ceylon, show no costal indentation of the yellow patch on the upperside of the forewing, others from Karachi, Kulu, Simla, Calcutta, Shillong, Upper Tenasserim, and the Andamans have a distinct black tooth, which is most prominent in a specimen from Buxa, Bhotan; in all of these the black inner margin of the forewing on the upperside gives off a projection into the first median interspace, while in examples from Karachi, Simla, Buxa, Calcutta, Shillong, Sibsagar, Rangoon and Upper Burma this projection assumes the form of a more or less separate and distinct spot. The width of the marginal black band on the upperside of the forewing is also variable; and, lastly, specimens from Bhotan and Upper Assam are very large and heavily marked, owing probably to the greater rainfall of those regions” (de Nicéville, Butt. Ind. ii. 73). “This butterfly affects paths, rocky, bare hill-sides, the beds of streams where they widen out into stony expanses of sand and boulders, and similar places devoid of vegetation. They are hard to catch, flying off on one’s approach and settling on a stone or rock a few yards ahead, and on again coming near, the same performance is repeated. It was common at Kalka, Umballa District, in October, 1877, and I took it in the Botanical Gardens and nowhere else in Calcutta, in December, 1878” (de Nicéville, Indian Agriculturist, January, 1880). “Col. J. W. Yerbury took a single specimen at Kali Pani, N.W. Punjab, in September, and another at Khairabad in November, also a few between Kali Pani and Abbottabad in September” (Ann. N. H. 1888, 142). “Found in Kumaon generally, up to 7000 feet elevation” (W. Doherty, J. A. S. Bengal, 1886, 123). “Occurs somewhat rarely, at low elevations in Sikkim, west of the Tista River, but is common at 1500 feet elevation to the East” (de Nicéville, Sikk. Gaz. 1894, 136). “This butterfly and *J. Orithya* may be seen, in the Central Provinces, resting in the middle of the most exposed parts of roads and paths, and rising in front of one, it skims swiftly along and settles again on the road, perhaps after a battle in the air with one of its own kind or *J. Lemonias*, *Asterie*, or *Orithya*, all of which have the same habits and love the full hot sunshine” (J. A. Bethune, J. Bombay N. H. S. 1890, 279). “Commonly found in ditches all the year round in Bombay and the Deccan” (Col. C. Swinhoe, P. Z. S. 1885, 128). “This is not

uncommon in Bombay on the uncultivated parts of Kamballa Hill, and about dry stubble fields" (E. H. Aitken, *id.* 1886, 131). "Pretty common in open country, but absent during the monsoon. We have reared the larva in the Dekkan and Khandeish, and found many at Karwar, in October, on a plant which appeared to be a species of *Barleria*. The ground-colour of the larva was usually dark brown or grey, with a broad dorsal stripe formed of minute white and blue spots, spines black" (J. Davidson and E. H. Aitken, *id.* 1890, 272; 1896, 249). Mr. S. N. Ward records finding the "larva at Koonoor in January and December on the *Kolay Mooloo* and *Byle Choolee*" (MS. Notes). Col. C. H. E. Adamson records it as "very common in Burma." Signor L. Fea took it in Bhamo in July and November. Commander A. Carpenter obtained it in Mandalay in January. Dr. J. Anderson found it "very common in Mergui and King Island, Tenasserim, in December, January, and February" (J. Linn. Soc. Zool. 1886, 35).

In Ceylon, according to Mr. F. M. Mackwood, "it is a scarce, low country insect." Capt. Wade took it at Kandy and at Dambool.

We possess specimens from Kasauli, W. Himalaya; Kutch, Kattywar, Sind; Bombay; Nilgiris; Chittagong, Bhamo, Burma; Mergui; Andamans; Nicobars; Hainan; China; and Mr. J. J. Walker records it from Hong Kong.

**JUNONIA LEMONIAS** (Plate 313, fig. 1, 1a, b, c, d, e, ♂ ♀).

*Papilio Lemonias*, Linnaeus, Syst. Nat. x. ed. p. 473 (1758); xii. p. 770 (1767). Clerck, Icon. Ins. iii. pl. 7, fig. 2 (*ined.*). Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 7, 11 (1776). Herbst, Nat. Schmett. p. 158, pl. 177, fig. 3, 4 (1794).

*Hamadryas Lemonias*, Hübner, Samml. Exot. Schmett. i. pl. 50 (1806-16).

*Junonia Lemonias*, Doubleday and Hewits. Gen. D. Lep. p. 208. Butler, Catal. Fabr. Lep. B. M. p. 74 (1869). Moore, Lep. Ceylon, i. p. 41, pl. 21, fig. 3, 3a, ♂ ♀ (1881). Distant, Rhop. Malay. p. 96, pl. 11, fig. 5, ♂ (1882). de Nicéville, Butt. India, etc., ii. p. 70 (1886).

*Papilio Aonis*, Cramer, Pap. Exot. i. pl. 35, fig. D, F (1775).

*Junonia Aonis*, Hübner, Verz. bek. Schmett. p. 34 (1816).

IMAGO.—Male and Female. Upperside greyish olive-brown; cilia alternated with pale ochreous-yellow. *Forewing* with two black sinuous lines crossing middle of the cell, joined to a pale ochreous-yellow streak, and two black sinuous lines at its end, followed by a contiguous pale ochreous broken streak; a transverse discal outwardly-recurved row of blackish-bordered pale ochreous-yellow spots, a sub-marginal broken row of similar coloured but more irregular-shaped spots, and then an outer marginal row of duller coloured lunular spots; a subapical very indistinct small black ocellus with blue central dot and reddish outer ring between the radial veinlets, and a large prominent red-ringed similar ocellus between the lower and middle medians. *Hindwing* with a large prominent similar ocellus with bright red

ring and outer black ring placed between and extending over the lower subcostal and radial, this ocellus being either simply round and perfect, or the outer red and black ring encompassing a smaller upper blue-centred black spot, and sometimes also a still smaller lower spot; a small obscure brown ocellated spot is also generally present between the lower median veinlets; two short indistinct black lines at end of the cell, and two outer marginal black lunular lines outwardly-bordered by pale ochreous lines. Underside. Both wings (in the *wet-season* form) brownish-ochreous; crossed by pale yellowish-ochreous basal, discal, and marginal sinuous fasciæ, the forewing having the two ocelli as on upperside, but less defined, and the hindwing the two ocelli either very small, and of equal size, or both the latter are large and the upper one duplex. In the *dry-season* form both wings are uniformly pale dull yellowish-ochreous or ochreous-red; with paler-defined transverse markings, the lower ocellus only being present on the forewing, and a series of minute ocellate spots on the hindwing. *Body* and palpi above olive-brown, beneath and legs pale ochreous-white; antennæ dark brown above, ochreous edged with white beneath.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—“*After first moult*; ground-colour jet black, with four equidistant rows of conical jet-black spines which are finely branched; abdomen pale brown-black; legs black; head black, with a transverse yellow band behind; stigmata white. *After last moult*. Length one inch, cylindrical and spiny; lead-colour, minutely spotted with darker and whitish dots; dorsal line black as far as 1st and 2nd segments, and then replaced all the way by a row of black branched-spines; also four rows of equidistant black longitudinally-placed spines; lateral line milky; abdomen and legs lead-colour, thoracic legs black; head brown, strongly speckled with elevated black spots and having two little bundles of spiny hairs in front, and on centre a white triangular patch, shaded all round with black; anterior portion of first segment yellow-ochre; sides of segments transversely striated with dark lead-colour; stigmata black. *Habits*. Lazy. *Food-plant*.—The thorny *Barleria* (*Barleria prionitis*). *Changed to Pupa* on the 28th Sept., 1860.”

PUPA.—“Suspended; light brown, speckled with whitish and variegated with darker brown. *Imago* emerged on 5th Oct., 1860” (Capt. H. L. Chaumette, Lucknow, 1861. *MS. Notes*).

HABITAT.—“India; Ceylon; Burma; Tenasserim; Malay Peninsula; Siam; S. China; Hong Kong; Hainan; Formosa; Philippines.

DISTRIBUTION, HABITS, ETC.—This is a widely-spread and common Indian species, occurring almost everywhere in the plains in the region of heavy rainfall, and extending into the Hills up to 7000 feet elevation. I possess two ‘sports,’ both females, from Malda and Orissa, which have all the markings blurred and obliterated on both sides” (de Nicéville, Butt. Ind. ii. 70). Mr. W. Doherty took it in



"Kumaon; plains up to 6000 feet elevation" (J. A. S. Bengal, 1886, 123). "Common all the year at Lucknow. Flight rapid, generally with out-spread wings, soaring along the ground so that it is difficult to trace them. Fond of fruits, particularly that of the Guava. Larva reared in Sept., on *Barleria prionitis*" (Capt. H. L. Chaumette, MS. Notes). "Common in Sikkim up to 5000 feet, and found all the year round" (H. J. Elwes, Tr. Ent. Soc. 1888, 342). "This is the commonest species of the genus in the Central Provinces, and is found everywhere. It is fond of hedges and ditches, and is a very sprightly and pugnacious butterfly" (J. A. Bethune, J. Bombay N. H. S. 1890, 279). "Commonly found in ditches all the year round, in Bombay and the Deccan" (Col. C. Swinhoe, P. Z. S. 1885, 128). "Though not rare anywhere, this is the commonest butterfly in Bombay at the close of the rains and for some time after. It attains in old age to a degree of disreputability and raggedness not often seen in any other species. I am inclined to think this is the result of ineffectual attempts to catch it on the part of lizards, with which it is a favourite food. The larva feeds on *Lippia nodiflora* and *Asteracantha longifolia*, both very abundant in Bombay during the monsoon, by the side of, or actually in water. The larva is scarcely distinguishable from that of *J. Almana*. I have also found the larva on *Barleria prionitis*" (E. H. Aitken, J. Bombay N. H. S. 1886, 131). "It frequents drier country than *Asterie* and *Almana*; it is also found in thick forest, where the larva feeds on *Strobilanthus*. The larva has two minute spines on the head, which are wanting or less developed in the others (*id.* 1896, 249). "Common in the Travancore Hills up to 2500 feet elevation" (H. S. Ferguson, J. Bombay N. H. S. 1891, 8). In Ceylon it "occurs in the Eastern and Western Provinces, in low country forests and cultivated ground. Found occasionally, at uncertain intervals, at Colombo, more common on the road to Trincomalie. Flight quick; settles on the ground" (Lep. Ceylon, i. 41). "Very common throughout Burma. I have one 'sport' caught in September on the Upper Chindwin, with all the markings, including the ocelli on the upperside of the wings, obsolete, with the exception of an indistinct submarginal paler line" (Col. C. H. E. Adamson, List, 1897, 19). Signor L. Fea took it at Cheba in November, and at Palone in August. Commander A. Carpenter, R.N., obtained it at "Sheemagar, Upper Burma, in December, and at Katha in January" (Ann. N. H. 1886, 184). Mr. Otto Limborg took it at "Ahsown, 2000 feet, Moulmein, Meetan, at 3000 feet, and at Taso, in March" (P. Z. S. 1878, 828). Dr. J. Anderson found it "very common in the Mergui Archipelago, in December, January, and March" (J. Linn. Soc. Zool. 1886, 35). Mr. H. Druce records it from Chentaboon and Nahconchaisee, Siam" (P. Z. S. 1874, 105).

Of our illustrations on Plate 313, fig. 1, 1a, d, e, represent the upper and underside of *wet-season* form, and fig. 1b, c the underside of *dry-season* form.

## JUNONIA ALMANA.

*Dry-season form* (Plate 314, fig. 1, larva and pupa, 1a, b, c, ♂ ♀).

*Papilio Alman*, Linnæus, Syst. Nat. x. ed. p. 472 (1758); xii. p. 769 (1767). Fabricius, Syst. Ent. p. 490 (1775). Cramer, Pap. Exot. i. pl. 58, fig. F, G (1775). Herbst, Pap. pl. 172, fig. 1, 2 (1794). Donovan, Ins. China, pl. 36, fig. 2 (1798).

*Alcyoneis Alman*, Hübner, Verz. bek. Schmett. p. 35 (1816).

*Junonia Alman*, Doubleday and Hewits. Gen. D. Lep. p. 209 (1849). Moore, Catal. Lep. Mus. E. I. C. i. pl. 12, fig. 12, 12a, larva and pupa (1857). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Swinhoe, P. Z. S. 1885, p. 128. de Nicéville, Butt. India, etc., ii. p. 61 (1886).

IMAGO.—Male and female. *Forewing* with the extreme edge of exterior margin even and acutely angulated outward below the apex and obtusely at end of lower median. *Hindwing* also even and obtusely angulated at end of upper median and prolonged at anal angle. Upperside ochreous-red, basal areas slightly infuscated. *Forewing* with the costal border and outer margin ochreous-brown; two black sinuous lines crossing middle of the cell, two at its end with the internal area dark bluish-black, followed by a somewhat similar black narrower fascia, between which and the apex is a subtriangular black patch more or less enclosing two ocellated spots, the upper spot smallest or generally obsolete, the lower spot blue-black with whitish-speckled centre; a lower-discal larger similar ocellated spot, with black outer ring, between the middle and lower medians; a submarginal and two marginal blackish sinuous lines. *Hindwing* with a very large upper-discal ocellated spot, which is purplish with two small inner dentate dots and outer black patch, yellow ring and outer black ring; a much smaller similar lower-discal ocellated spot with small white dot, which is more or less ill-defined and sometimes obsolete; submarginal and marginal sinuous lines as on forewing, but more defined. Underside pale or obscure brownish-ochreous. *Forewing* crossed by three obscure basal darker sinuous fasciæ, a discal slender sinuous pale line, an outer-discal dusky fascia traversed by a row of small blackish dots and a lower ill-defined ocellus, followed by a submarginal sinuous line. *Hindwing* crossed by a subbasal wavy pale ochreous line and a straight dark-edged discal line, an outer-discal row of small blackish dots, of which the upper two and sometimes the lowest are obscurely ocellate, followed by a submarginal sinuous brown line. *Body* above ochreous-red; palpi above brownish-ochreous; body and palpi beneath and legs pale whitish-ochreous; antennæ dark brown above, beneath and tip ochreous.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{5}{10}$  inches.

*Wet-season form* (Plate 314, fig. 1, d, e, f, ♂ ♀).

*Papilio Asterie*, Linnæus, Syst. Nat. x. ed. p. 472 (1758); xii. p. 769 (1767). Fabricius, Syst. Ent. p. 490 (1775). Cramer, Pap. Exot. i. pl. 58, fig. D, E (1775). Herbst, Pap. p. 131, pl. 172, fig. 3, 4 (1794).

*Alcyoneis Asterie*, Hübner, Verz. bek. Schmett. p. 35 (1816).

*Vanessa Asterie*, Horsfield, Catal. Lep. Mus. E. I. C. pl. 7, fig 1, 1a, larva and pupa (1829).

*Junonia Asterie*, Doubleday and Hewits, Gen. D. Lep. p. 209 (1849). Moore, Catal. Lep. Mus. E. I. C. i. p. 142, pl. 5, fig. 6, 6a, larva and pupa (1857); Lep. Ceylon, i. p. 43, pl. 22, fig. 2 (1881). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Distant, Rhop. Malay. p. 94, pl. 11, fig. 1, 2 (1882). de Nicéville, Butt. India, etc., ii. p. 67 (1886).

*Papilio Almanæ*, Clerck, Icon. Ins. iii. pl. 5, fig. 3 (*ined.*); Linn. Mus. Ulr. p. 272 (1764).

*Junonia Nicobariensis et Javana*, Felder, Verh. Z. B. Gesch. 1862, pp. 482, 487.

IMAGO.—Male and female. *Forewing* with the outer margin slightly angular below the apex, and slightly scalloped. *Hindwing* with the exterior margin convex and slightly scalloped, anal angle pointed. Upperside ochreous-red, basal area slightly infuscated. Both wings with all the markings as in *dry-season* form, except that the marginal lines are darker and more prominent. Underside pale brownish-ochreous. *Forewing* crossed by blackish basal, discal, and marginal sinuous lines, those of the two former with pale inter-area, the two upper and the lower ocellus well defined. *Hindwing* crossed by a subbasal wavy blackish line inwardly bordered by ochreous-white, and a similar whiter-bordered straight discal line, the ocelli prominent, the upper oval and duplex, the lower larger than on upperside; marginal lines distinct. *Body* above ochreous-red, palpi brown, beneath and legs pale whitish-ochreous.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

LARVA.—Cylindrical. Head blackish, slightly hairy. Body pale ochreous-brown, with a dorsal, subdorsal and lateral blackish line, and a row of small black-ringed spots below the latter; second segment anteriorly with a transverse reddish stripe; second, third, and fourth segment posteriorly with a transverse blackish stripe; second to last segment armed with a dorsal, subdorsal, and two lateral rows of short fine branched-spines.

PUPA.—Rather short and thick; head and thorax broad, head-piece pointed beneath; thorax and abdomen dorsally with short tubercular points; colour brownish-ochreous. (Described from Mr. A. Grote's Calcutta Drawing.)

HABITAT.—India; Ceylon; Burma; Tenasserim; Andaman and Nicobar Isles; Malay Peninsula; Sumatra; Java; Borneo; S. China; Hong Kong; Formosa; Philippines; Japan.

DISTRIBUTION, SEASONAL APPEARANCE, HABITS, ETC.—“This species (*Almanæ*) occurs throughout continental and peninsular India and in the outer Himalayas up to about 6000 feet elevation. It is not recorded from Ceylon or the Malay Peninsula, but is common through Assam, Silhet, Cachar to Burma, Mergui and Upper Tenasserim. It occurs in the Andamans, in Java and China, and wherever met with is a common insect. It will be seen from the localities quoted above, that

except in Ceylon, the Nicobars and the Malay Peninsula, *J. almana* is found wherever *J. asterie* occurs; and from observations I have made on the time of appearance of the two forms, I have found that *J. almana* is the prevailing form in the *dry-season*, while *J. asterie* abounds in the *wet-season*, the times of appearance and periods of existence occasionally overlap somewhat; a worn *J. almana* may be found early in the rains, or a *J. asterie* now and then in the early winter, but speaking generally, the summer brood is *J. asterie*, and the winter brood is *J. almana*, and it is very probable that further investigation will reveal that they are merely seasonal forms of one and the same species. The two forms are variable also both in outline of the wings and in the markings of the underside: in some specimens of *J. asterie* the forewing is almost as truncate, and the hindwing as prominently tailed, as in *J. almana*, while the ocelli on the underside are very inconstant; they vary much in size, and in some specimens they are so pale and obscure as to be barely traceable, and it is difficult, if not impossible, to decide to which form these intermediate specimens belong. The absence of *J. almana* from the localities noted above, if it be a fact, might be accounted for by the seasons in those parts being more equable and more uniformly moist throughout the year; but the question of the distinctness or otherwise of the two forms can only be satisfactorily settled by a series of experiments in breeding them. *J. asterie* is a common butterfly throughout the tract of heavy rainfall, and is abundant where it occurs; it frequents gardens and glades in jungles, but shuns the bare open plains" (de Nicéville, Butt. Ind. ii. p. 68). Col. J. W. Yerbury records the capture of *Almana* at Attock, north-west of Campbellpur, in March, and at Hurripur in October. *Asterie* was taken at Khairabad, opposite Attock across the Indus, in April, May, and July, and at Campbellpur in May, and at Hassan Abdal in May" (Ann. N. H. 1888, p. 141.) Both *Almana* and *Asterie* are found in the Sarju and Kali Valleys, 2000 to 4000 feet elevation, in Kumaon, and in the Tarai. The prehensores are the same in both. I have no doubt that the former is the *dry-season* form and the latter the *wet* form. Colonel C. Swinhoe remarks that "*J. almana* is common everywhere, in Bombay and the Deccan, all the year round, *J. asterie* is common in the latter half of the year. I am convinced that, although the types of each are so different, they are both one and the same insect, one being the normal and the other the dimorphic form, and I have a long series of examples showing every stage of variety between the two" (P. Z. S. 1885, 128). We possess a male, taken at Poona in March by Col. Swinhoe, which has the outline of both wings less angulated than in the normal dry-season form (*Almana*) and the colours and markings on the underside distinctly gradating to the *wet-season* form. "*J. asterie* and *J. almana*, I am persuaded, are one and the same species. In the Central Provinces they are found in glades and gardens by the margins of streams and about tanks, and sits and fans its wings in the sunshine.

*J. Asterie* is the commoner in the wet-season, while *J. almana* predominates in the dry-season" (J. A. Bethune, J. Bombay N. H. S. 1890, 279). "Common everywhere in the Bombay district, frequenting damp grounds and ditches. The *Almana* form appears in October, and gives place to *Asterie* in June" (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 249). "We have reared *Almana* in Bombay on *Asteracantha longifolia*, which grows in wet ditches everywhere during the monsoon and withers soon after. The butterfly appears in October, a little later than *Asterie*. In Bombay we have reared *Asterie* on *Lippia nodiflora*, and once, in company with *Almana*, on *A. longifolia*" (id. *l.c.* 1890, 272). Mr. F. M. Mackwood states that *Asterie* is "found in Ceylon all the year round, occurring in the Plains and up to 4000 feet. Very abundant about September to November. Capt. Hutchison found it, in the Plains of the Western Provinces, in open and waste land among shrubs. Its habits like those of *Orithya*, but quicker in flight and more shy. Capt. Wade took it at Galle and Kandy; sits on roads and paths basking in the sun (Lep. Ceylon i. 43). Mr. A. Grote, in his Calcutta drawings, states that the larva "feeds on *Gloxinia* and *Osbeckia*." "In Sikkim it is found at low elevations throughout the year. It is, however, rarer west of the Tista river than it is on the eastern side, and it does not appear to occur in the inner valleys. I do not think there can be any doubt about *Almana* being the dry-season and *Asterie* the wet-season form of one and the same species" (de Nicéville, Sikkim Gaz. 1894, 135). "Both forms of this insect are very common throughout Burma, the ocellated form (*Asterie*) appears to be the more abundant, as I have caught it in all the months of the year, while the unocellated form I have only caught in Lower Burma from November till June" (Col. C. H. E. Adamson, List 1897, 18). Dr. J. Anderson records both forms (*Asterie* and *Almana*) as being taken in "Minthantoung, Mergui, in December" (J. Linn. Soc. Zool. 1886, 34). Mr. H. Druce records it from "Nahconchaisee, Siam" (P. Z. S. 1874, 105). Mr. J. J. Walker (Tr. Ent. Soc. 1895, 453) records it as "common in Hong Kong among long grass, especially in somewhat damp open places, but also found on the flowers of *Lantana camara*. Those taken in December, January, and February are nearly all of the form *Almana*, occasionally, however, examples occur in these months with the ocelli of the under-side more or less developed, approaching in this respect to the wet-season form *Asterie*, which appears at the end of April and in May. I also found *Almana* commonly at Hang-chau, Haining, and Shanghai, in October, the specimens being much larger and finer than those taken in Hong Kong." We possess specimens from Java showing that both the *dry* and *wet-season* forms do occur there. The *dry-season* form, however, has the outline of the wings as in *Asterie* (wet-season), the under-side being dull brownish-ochreous, with markings and the discal row of small black dots, as in *Almana*. The Javan wet-season form being normal *Asterie*.

INDO-MALAYAN SPECIES.—*Junonia neglecta* (Precis neglecta, Swinhoe, Ann. Nat. Hist. 1899, p. 103). *Habitat.* N. Borneo; Sarawak.—*Junonia Horsfieldii*. Male and female. Distinguishable from Indian, Burmese, and Malacca examples of *J. Iphita*, on the upperside, by the uniformly darker basal area, discal and outer band; the discal edge of the basal area on forewing being less angulated above the median, the discal fascia on both wings broader and more diffused, the submarginal line being also broadly diffused, the ocellate spots on the hindwing are small and well defined. Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{5}{10}$  inches. *Habitat.* Java.—*Junonia intermedia* (Precis intermedia, Felder, Reise Nov. Lep. iii. p. 402 (1866). *Habitat.* Macassar; Celebes.—*Junonia Erigone* (Pap. Erigone, Cram. Pap. Exot. i. pl. 62, fig. E. F. (1779). *Habitat.* Java.—*Junonia Ida* (Pap. Ida, Cramer, Pap. Exot. i. pl. 42, fig. C. D. (1775), *id.* iv. pl. 374, fig. C. D.). Precis Ida, Distant, Rhop. Malay. p. 92, pl. xi. fig. 10 (1882). *Habitat.* Malay Peninsula; Nias; Sumatra; Billiton, Sarawak, Borneo; Java.—*Junonia Adelaida* (Precis Adelaida, Staudinger, Deuts. Ent. Zeit. 1889, p. 51). *Habitat.* Palawan.—*Junonia Wallacei*, Distant, Rhop. Malay. p. 95, pl. xi. fig. 3, 4, ♂ ♀ (1883). Pap. Ocyale, Hübner, Samml. Exot. Schmett. ii. pl. 33, fig. 1-4 (1820-6). *Habitat.* Malay Peninsula; Borneo; Sumatra; Java.—*Junonia Villida* (Pap. Villida, Fabricius, Mant. Ins. ii. p. 35 (1787). Donovan, Ins. N. Holl. pl. 25, fig. 3). Moore, Catal. Lep. Mus. E. I. C. i. p. 141 (1857). *Habitat.* Australia (Port Darwin, Champion Bay). Gilbert Island; Viti; Ellice Island; New Guinea; Java (Horsfield); Sumatra (Raffles). We possess a male and female of *Villida* from Horsfield's collection, both in very fine condition, labelled "Java, November," and a male, also labelled "Java," from another collection.

#### Genus EUVANESSA.

*Euvanesa*, Scudder, Butt. E. U. S. i. p. 387 (1889).

*Papilio*, Scudder, Syst. Rev. Amer. Butt. pp. 11, 16 (1872).

*Scudderia*, Grote, Canadian Ent. v. p. 144 (1873), *pre-occupied*.

*Vanessa* (part), Auctorum.

IMAGO.—Wings broad. Male. *Forewing* subtriangular; costa slightly arched from the base; exterior margin very slightly oblique, acutely scalloped, a prominent angle projecting below the apex and a lesser angle at end of lower median veinlet; posterior margin nearly straight; costal vein extending to about two-thirds the margin; first subcostal branch emitted at one-third before end of cell, second branch at one-ninth before the end; upper and middle discocellulars very short, middle concave at its base, lower discocellular very slender and obliquely recurved; cell broad; middle median veinlet emitted opposite upper discocellular at from considerable distance before lower end of the cell. *Hindwing* triangulate; arched from the base; exterior margin obliquely convex, acutely scalloped, and with a prominent

projecting caudate point at end of upper median; precostal vein bent inward; cell closed by a slender lower discocellular veinlet. Both wings beneath with very numerous long fine rigid bristly hairs projecting from between the scales, some of the hairs on the forewing being projected forward from front of the base of the costa. *Body* very robust, thorax densely woolly above and thickly clothed beneath with long fine rigid hairs; palpi porrect, slender, projecting half beyond the front, laxly clothed with fine long rigid hairs; fore tibiæ and tarsi of the male sparsely clothed with long fine bristly hairs, femora with shorter and more delicate hairs beneath; fore tibiæ and tarsi of the female more sparsely clothed with long fine bristly hairs, tarsal joints apical and minutely spurred at sides beneath; antennæ with a lengthened cylindrical club; eyes hairy.

**LARVA.**—Head subquadrate in front, sides rounded, almost flat, vertex indented in the middle, numerous covered with short conical tubercles, the smallest emitting each a short hair. Body cylindrical, very minutely warted and hairy; armed with a dorsal and five lateral rows of long minutely-branched spines.

**PUPA.**—Stout. Thorax dorsally angled and with a larger hindward projected pointed process; abdominal segments with a dorsal and a lateral row of broad tubercular points; wing cases somewhat large; head-piece widely cleft and pointed.

**TYPE.**—E. *Antiopa*.

**EUVANESSA ANTIOPA** (Plate 316, fig. 1, 1a, ♂).

*Papilio Antiopa*, Linnæus, Syst. Nat. x. ed. p. 476 (1758); *id.* xii. ed. p. 776 (1767). Esper, Schmett. i. pt. i. pl. 12, fig. 2 (1777); *id.* pl. 29, f. 2 (1778). Hübner, Eur. Schmett. i. fig. 79, 80 (1793). Scudder, Syst. Rev. Amer. Butt. pp. 11—16 (1872).

*Vanessa Antiopa*, Godart, Enc. Méth. ix. p. 308 (1819). Moore, Catal. Lep. Mus. E. I. C. i. p. 136 (1857). Elwes, Proc. Zool. Soc. 1881, p. 898. de Nicéville, Butt. of India, etc., ii. p. 232 (1886).

Leech, Butt. of China, etc., i. p. 256 (1893). Kirby, Allen's Nat. Hist. Butt. i. p. 88 (1894).

*Eugonia Antiopa*, Hübner, Verz. bek. Schmett. p. 37 (1816).

*Scudderia Antiopa*, Grote, Canadian Ent. v. p. 144 (1873).

*Nymphalis Antiopa*, Kirby, Catal. D. Lep. Suppl. p. 732 (1877).

*Euvanesa Antiopa*, Scudder, Butt. E. U. S. i. p. 397 (1889).

**IMAGO.**—Male and female. Upperside. Both wings rich dark purpurescent-

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Genus NYMPHALIS,\* Linnæus, S. N. x. ed. p. 472 (1758). *id.* xii. ed. i. 2, p. 769 (1767). Esper, Schmett. p. 87 (1777). Barbut, Gen. Ins. Linné, pp. 162, 172 (1781). Cuvier, Tabl. Elem. H. N. p. 589 (1798). Kirby, Syn. Catal. D. Lep. App. p. 648 (1871); *id.* Suppl. p. 732 (1877). Moore, Lep. Indica, ii. p. 226 (1895). Syn. Hamadryas, Hübner, Tent. i. (1806). Inachis, Hübn. Verz. p. 37 (1816). Vanessa, Moore, Lep. Ceylon, i. p. 48 (1880).—TYPE *Nymphalis Io*, Linn.

\* We refer the origin and authorship of this genus to Linnæus. See Historical Note (Lep. Indica, ii. p. 226) on its restriction to the typical species, as here assigned.

red, the outer border with a broad ochreous marginal band, which is more or less densely marked with black-speckled transverse strigæ, and is inwardly bordered by a parallel black sinuous-edged band, which latter is broadest on the hindwing, and on both wings bearing a series of rich shining blue spots between the veins, these spots being dentate on forewing, and more of an oval shape on hindwing, becoming obsolescent towards the anal angle. *Forewing* also with the costal border black, striated with ochreous, and having two paler ochreous short broad bars before the apex. *Underside*. Both wings rich dark purpurescent greyish-black, densely covered with transverse black strigæ; marginal ochreous band as above, but paler and more densely striated, its inner bordering band formed of narrow black dentate marks with bluish-grey speckled centres; a very small ochreous dentate spot at lower end of each cell. *Forewing* also with less defined pale ochreous costal strigæ, and the two narrower bars before the apex. *Hindwing* also crossed by a slender black irregular discal line. *Body* above dark purpurescent-red; palpi blackish, the sides ochreous; forelegs, middle and hind femora blackish, middle and hind tibiæ and tarsi ochreous; antennæ black, tip and beneath reddish-ochreous.

Expanse, ♂ 3, ♀  $3\frac{2}{10}$  inches.

HABITAT.—Europe; C. Asia; E. Himalayas; W. China; Amurland; Japan.

DISTRIBUTION.—“Within our limits, this species has been obtained by Mr. H. J. Elwes and Mr. Otto Moller, in native Sikkim and across the passes in Chumbi. It has also been recorded from Bhotan” (de Nicéville, *l.c.* 233). “I have no knowledge of the occurrence of this in Sikkim proper, although I received a considerable number from native collectors, which were taken in Chumbi or Bhotan, in July and August. I am not aware that it has been taken in any other part of the Himalayas” (Elwes, *Tr. Ent. Soc.* 1888, 362).

### Genus EUGONIA.

*Eugonia*, Hübner, *Verz. bek. Schmett.* p. 36 (1816). Stephens, *Catal. Brit. Lep. B. M.* p. 12 (1850). Scudder, *Butt. E. U. S. i.* p. 372 (1889).

*Nymphalis*, Scudder, *Syst. Rev. Amer. Butt.* p. 10 (1872).

*Vanessa*, Staudinger et Schätz, *Exot. Schmett. ii.* p. 124 (1887). Kirby, *Allen's Nat. Hist. Butt. i.* p. 88 (1894).

IMAGO.—Wings broad. Male. *Forewing* subtriangular; costa much arched from the base; exterior margin slightly oblique, prominently scalloped and broadly angled below the apex and at end of lower median veinlet; posterior margin nearly straight; costal vein extending to half the margin; first subcostal branch emitted at about one-fourth before end of the cell, second close to the end; upper and middle discocellular of nearly equal length, middle bent outward near its base, lower



discocellular slender and obliquely recurved; middle median veinlet from some considerable distance before lower end of cell, lower median at fully half before the end. *Hindwing* short, triangular; exterior margin very obliquely convex, prominently scalloped, with a prominent projecting broadly-obtuse caudate angle at end of upper median, and a less similar angle at end of lower median; precostal vein straight; cell closed by a slender lower discocellular veinlet. Wings beneath with numerous projecting rigid bristly hairs, some of which project forward from base of costa on the forewing. *Body* robust; palpi somewhat compressed laterally, clothed throughout with short erect hair-like scales, interspersed with long erect bristly hairs; antennæ with a stout cylindrical club; fore tibiæ and tarsi, in the *male*, rather thickly but laxly clothed with longish fine silky hairs interspersed with much longer and more bristly hairs; femora beneath with longish fine silky hairs; fore tibiæ and tarsi, in the *female*, less thickly clothed with fine longish hairs, shortest and decreasing to near tip of tarsi, apical joints minutely spined. Eyes hairy.

LARVA.—Cylindrical, slightly hairy. Head subquadrate, vertex sharply indented in front, slightly hairy, front and cheeks with several small pointed tubercles. Third to last segment armed with a dorsal row of short spines and three lateral rows of long rigid branched-spines.

PUPA.—Stout. Head-piece cleft and pointed; thorax with a rounded posterior prominence; abdominal segments with a dorsal row of points and a lateral row of lesser tubercular points.

TYPE.—E. Polychloros.

**EUGONIA XANTHOMELAS** (Plate 316, fig. 2, 2a, ♂ ♀).

*Papilio Xanthomelas*, Denis et Schieffermüller, Wien. Verz. p. 176 (1776). Esper, Schmett. i. pt. 2, pl. 63, fig. 4 (1780). Hübner, Eur. Schmett. i. fig. 85, 86 (1793). Ochsenheimer, Schmett. Eur. i. p. 117 (1807).

*Vanessa Xanthomelas*, Godart, Enc. Méth. ix. p. 820 (1823). Moore, Catal. Lep. Mus. E. I. C. i. p. 137 (1857); P. Z. S. 1882, p. 240. de Nicéville, Butt. of India, etc., ii. p. 235, pl. 18, fig. 73, ♂ (1886). Leech, Butt. China, etc., i. p. 260 (1893).

IMAGO.—Male and female. Upperside rich fulvous. *Forewing* with the costal edge more or less striated with olivescence-ochreous and black; two black spots superposed obliquely outward in middle of the cell, which are often more or less joined together and sometimes forming a single quadrate spot; a large quadrate black patch from the costa at end of the cell, then a pale yellow diffused costal patch, another black patch outwardly decreasing in width to or below the lower radial, and then a pale yellow more or less narrow subcostal macular streak; within the disc are two superposed somewhat quadrate black spots between the upper and

lower medians, and two black spots within the submedian interspace, the inner spot largest, the outer one more or less distinct, or formed by sparsely disposed black speckles or sometimes obsolete; outer margin broadly black and traversed by two ill-defined ochreous marginal lunular lines edged inwardly by a blue-speckled line and outwardly at ends of the veins by blue-speckled spots. *Hindwing* with a large irregular-shaped black patch from the middle of costa decreasing in width to the radial veinlet, the discocellulars defined by two black-speckled lines; outer margin broadly black, and traversed by a prominent continuous series of blue lunules, and two outer ochreous lines, the angled ends of the veins also blue-speckled; abdominal margin greyish-brown. Underside ochreous, densely covered with darker brown and black slender strigæ; the basal half and outer margins almost black; sinuous cell marks and outer marginal lunules with dull dark bluish-grey centres; base of wings clothed with numerous long fine hairs, some of which on the forewing project from front of the costa. *Body* and palpi above olivaceous ochreous-brown, beneath and legs pale ochreous-brown; antennæ black above and annulated with white, beneath and tip reddish ochreous.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{4}{10}$ , ♀  $2\frac{6}{10}$  to 3 inches.

**LARVA.**—Cylindrical, slightly hairy. Head subquadrate, vertex sharply indented in front, slightly hairy, front and cheeks with several small pointed tubercles. Third to last segment armed with a dorsal row of short spines and three lateral rows of long rigid branched-spines. Colour dark purpurescent-brown, almost black, palest beneath; with two dorsal slender yellowish macular lines and a single similar lateral line, the subdorsal and sublateral area longitudinally speckled with numerous irregular-shaped yellow dots. Spines black; head black. Reared on willow. (Described from preserved specimen, Coll. Hocking.)

**HABITAT.**—E. Europe; W. Himalayas; C. Asia; Corea; Japan.

**DISTRIBUTION.**—"In India this is a rare species, and appears to be confined to the Western Himalayas. In Simla and Kulu it appears on the wing in the early summer for a very short period just after it has emerged from the pupa, it then disappears till the following spring, when the eggs are laid and the early stages of the insect rapidly passed through. Dr. T. C. Jerdon took a single specimen at Goolmurg in Kashmir. I have taken it near Dalhousie. Mr. A. Graham Young has bred it in Kulu on the 'Kukkuree' *Pistachia integerrima*, the 'larva being gregarious, under a loose web whilst feeding, when about to change to pupæ they desert the food-plant and disperse amongst low herbage'" (de Nicéville, Butt. Ind. ii. 235). "It is by no means a common insect, I have taken a few at Simla, again at Kujeah, near Dalhousie, in May, and at Ulwas, near Pangi, a little later on" (*id.* Indian Agriculturist, January, 1880). "It occurs at Goolmurg, Cashmere, in July and August. It is taken in the Simla district, where, however, it is not common"

(Capt. A. M. Lang, MS. Notes). It is "very rare in Masuri, a few hybernated specimens make their appearance in February. In March and April a fresh brood appears, which frequents the *Rhododendron* flowers. It occurs also at Nag Tiba, 8000 feet elevation, in May. The larva feeds on *Celtis australis*, N. O. Urticaceæ, and on a wild willow" (P. W. Mackinnon, J. Bombay N. H. Soc. 1898, 375). The Rev. J. H. Hocking "found the larva on willow on March 30th, in the Kangra district. Fed up April 6th; in pupa state from April 16th to 24th. Imago emerged on May 9th" (P. Z. S. 1882, 240).

Genus **AGLAIS**.

*Aglais*, Dalman, Vetensk. Acad. Handl. xxxvii. pp. 56, 64 (1816). Scudder, Syst. Rev. Amer. Butt. p. 16 (1872); Butt. E. U. S. i. p. 413 (1889).  
*Vanessa* (part), Auctorum.

IMAGO.—Wings broad. Male. *Forewing* triangular; costa much arched from the base, exterior margin slightly oblique, scalloped, and obtusely angled below the apex; posterior margin straight; costal vein extending to half the margin; first subcostal branch emitted at one-fifth before end of the cell, second branch close before the end; upper discocellular short, middle three times the length of upper, concave, lower discocellular slender, straight. *Hindwing* short, triangular; exterior margin obliquely convex, scalloped, with a projecting angle at end of upper median veinlet; precostal vein straight; discocellulars outwardly oblique; cell broad, closed. *Body* stout, palpi densely clothed with fine long and shorter hairs throughout; fore tibiæ and tarsi, in the *male*, rather thickly clothed with uniformly fine longish silky hairs; femora beneath the same; fore tibiæ and tarsi, in the *female*, laxly clothed with uniformly fine longish silky hairs, tarsal joints quite apical, the spines slender; antennæ with a short stout cylindrical club; eyes hairy.

LARVA.—Head rather flat in front, slightly indented at vertex, studded with bristly-points and hairs. Third to last segment armed with a dorsal and three lateral rows of branched-spines.

PUPA.—Head-piece pointed and bifid; thorax raised to a central angular ridge; abdominal segments with a dorsal and a lateral row of blunt tubercles.

TYPE.—*A. Urticæ*.

**AGLAIS KASCHMIRENSIS** (Plate 316, fig. 3, 3a, ♂ ♀).

*Vanessa Kaschmirensis*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 442, pl. xi. fig. 3, 4 (1844). Moore, Catal. Lep. Mus. E. I. C. i. p. 137 (1857). de Nicéville, Butt. of India, etc., ii. p. 233 (1886).  
*Vanessa Kaschmirensis*, Moore, Proc. Zool. Soc. 1882, p. 240. Doherty, Journ. As. Soc. Bengal, 1886, p. 121.

*Vanessa Kashmeriensis*, Elwes, P. Z. S. 1882, p. 403.

*Vanessa Flacilla*, Doubleday MS., in Gray's Lep. Ins. Nepal, p. 11 (1846).

IMAGO.—Male and female. *Forewing* with the ground-colour of the cell and discal area rich chestnut-red; base of the costa with short black and olivescient-ochreous strigæ; base of the cell and posterior margin densely covered with olivescient-ochreous scales; a black quadrate bar across middle of the cell, then a pale yellow bar, then another much broader black bar from the costal to upper median, with another pale yellow bar beyond it, and then again a third broad black bar with a small bluish-white costal spot placed outwardly beyond it; within the discal area are two rounded black superposed spots between the median interspaces, the lower one being the largest, and below which is an ill-defined narrow streak formed by blackish scales; a larger but more irregular and diffused black spot placed inwardly between the lower median and submedian, and having a narrow diffused pale yellow or whitish patch between it and the outer streak; outer margin broadly greyish-fuliginous traversed by a medial blacker lunular fascia and two outer paler lines. *Hindwing* with the basal two-thirds black, densely irrorated basally with olivescient-ochreous scales and numerous covered with similar coloured or reddish hairs; a broad outer-discal chestnut-red band with its inner edge irregular and its outer edge even, and its costal end diffusely-speckled with pale yellow or whitish scales; outer margin broadly greyish-fuliginous, traversed by a medial row of prominent deep black dentate-lunules with blue-speckled centres, and two outer marginal paler lines; abdominal margin greyish-fuliginous. Underside ochreous-brown, densely covered with slender short black strigæ; basal two-thirds clouded with dark brown and outwardly defined by an irregular zigzag black line, which is most distinct on the hindwing; cells of both wings crossed by two pairs of sinuous black lines centred with dull dark bluish-grey; outer margins traversed by a continuous row of black-speckled lunules with dull bluish-grey centres. *Body* and palpi above dark olivescient-brown, beneath and legs olivescient-grey; antennæ black above and articulated with white, shaft beneath and tip ochreous-red.

Expanse, ♂ 2 to  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

LARVA.—Head subquadrate, slightly hairy, vertex indented in the middle, forehead on each side with several strong short sharp spines each ending in a fine hair; face and cheeks minutely tuberculated; segments slightly hairy, armed with a dorsal and three lateral rows of long sharp branched-spines. Head black; spines blackish, segments dark purpurescent-black, almost black, paler beneath; with two dorsal and two sublateral slender yellow maculated lines, the subdorsal and sublateral interareas being numerous covered with minute yellow spots. (Described from preserved specimen in Rev. J. H. Hocking's Coll.)

PUPA.—Not known.

HABITAT.—Throughout W. and E. Himalayas.

DISTRIBUTION.—“ This butterfly abounds along the whole range of the Himalayas, and is as common in those mountains, as its ally *A. Urticæ* is in Europe ” (Capt. A. M. Lang, Ent. Mo. Mag. 1868, 34). We possess examples from Kaschmir, Simla, Kasauli, Masuri, and from Thundiani. Capt. H. B. Hellard took it in “ Simla, Masuri, Pangi in Busahir, and in Kaschmir, in July, August, and September ” (MS. Notes). Col. J. W. Yerbury found it “ rare in Murree in August, but very common on the top of Thundiani at end of September. Also taken at Mir Jani above Kalabagh, about 9000 feet elevation, in September ” (P. Z. S. 1886, 361). Mr. P. W. Mackinnon observed it as “ very common in Masuri and all over the Hills to the North, from May to October. The larva found feeding on various species of Urticaceæ ” (J. Bombay N. H. S. 1898, 375). Mr. L. de Nicéville says “ this butterfly may be met with, in the W. Himalayas, on fine days from January to December. It has several broods, and feeds on the common stinging nettle ” (Indian Agriculturist, 1880). Mr. W. Doherty took it “ in Kumaon, from the Kali Valley, 2500 feet, to the summit of the Lepu Lek, over 18,000 feet elevation—far above the snow line. I also found it abundantly in Nepalese Tibet and in the dry valleys of Hundes, Chinese Tibet. The prehensores, as drawn by me, are different from those of *Urticæ* as figured by Dr. B. White ” (J. A. S. Beng. 1886, 123). It “ occurs in Sikkim from 2000 to 3000 up to 12,000 feet and upwards ; commoner at low elevations in winter ” (H. J. Elwes, Tr. Ent. Soc. 1888, 362). Mr. de Nicéville says it “ occurs in Sikkim from 2000 to 12,000 feet, and at low elevations flies in every month of the year ; the larva feeds on different species of Nettle ” (Sikkim Gazetteer, 1894, 145).

In Mr. J. H. Leech’s collection are specimens from Kulu ; Kujjar, 6000 feet, taken by Capt. McArthur ; Gurais Valley, 7000, Kaschmir, taken in September ; Dugi Pass, 12,000 feet, Karakorum, taken by Capt. Thompson ; and from the Kuti Pass, 17,000, near Karakorum, in September, by Capt. McArthur.

**AGLAIS RIZANA** (Plate 317, fig. 1, 1a, ♂ ♀).

*Vanessa Rizana*, Moore, Proc. Zool. Soc. 1872, p. 559. de Nicéville, Butt. of India, etc., ii. p. 234 (1886).

*Nymphalis Rizana*, Kirby, Catal. D. Lep. Suppl. p. 733 (1877).

Male and female. Upperside. Differs from *A. Kashmirensis* in being a smaller insect, having the forewing less produced at the apex ; markings and colours disposed as in that species, but more sharply defined, and the colours much brighter. Forewing with the red colour near the base descending to near the submedian vein ; the posterior black spot being quadrate, well-defined, and broadly bordered outward with clear yellow, this colour also bordering the two upper discal spots, but palest in

the female; submarginal black border narrow and traversed by a single pale lunular line. *Hindwing* with the black base bordered outwardly by clear yellow, the submarginal row of blue-centred black dentate spots slightly, or in most, narrowly bordered inwardly by the dusky band. Underside much darker than in *Kashmirensis*; markings similar.

Expanse, ♂ ♀  $1\frac{8}{10}$  to 2 inches.

HABITAT.—N.-W. Himalayas.

DISTRIBUTION.—The type specimen was taken at Chini, at 9000 feet elevation, Middle Kunawur, in October. Capt. A. M. Lang also obtained it in Kunawur, at 10,000 feet elevation, and Dr. Jerdon at Gulmurg in Kashmir. Capt. H. B. Hellard took it in the "Rupin Pass at about 13,000 feet elevation in September, another seen near top of the Pass, which is about 15,000 feet elevation" (MS. Notes). Col. C. Swinhoe has examples from Kulu. In Mr. J. H. Leech's Collection are specimens from Sultanpur, Kulu, taken by Capt. Graham Young; the Goorais Valley, 7000 feet elevation, Kashmir, taken in June; Dugi Pass, 12,000 feet, taken in August and September by Capt. Thompson, and from the Kuti Pass, 17,000 feet elevation, taken in September by Capt. McArthur. Mr. L. de Nicéville records "a few specimens, obtained from time to time at very high elevations in native Sikkim, by native collectors" (Sikkim Gazetteer, 1894, 145).

#### AGLAIS LADAKENSIS (Plate 317, fig. 2, 2a, ♂ ♀).

*Vanessa Ladakensis*, Moore, Annals Nat. Hist. 1878, p. 227; Yarkund Exped. Lep. p. 2, pl. 1, fig. 2 (1879). Elwes, Proc. Zool. Soc. 1882, p. 403. Doherty, Journ. Asiat. Soc. Bengal, 1886, p. 122. de Nicéville, Butt. of India, etc., ii. p. 234 (1886). Elwes, Trans. Ent. Soc. 1888, p. 362.

Male and female. Nearest allied to *A. Rizana*. Both wings with the outer margin less angled. Upperside with similarly-disposed markings, the black markings somewhat duller and less sharply defined and the red colour less intense. *Forewing* with the two upper black bands merging into or being confluent with the discal oblique band below the cell; the outer yellow band from the costa is wider and extends across the wing to the posterior margin, enclosing the two small black discal spots, this band being diffusedly-bordered with red outwardly and inwardly below the median veinlets; the subbasal red band is narrower. On the *hindwing* the black basal area has its discal edge more irregular and more diffusedly yellow-bordered. Other markings similar. Underside. Ground-colour much paler than in *A. Rizana*, the strigæ also paler, the cell interspaces between the bars and the discal transverse fascia of the forewing more defined, the black discal line on hindwing more irregular.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀  $2\frac{1}{10}$  inches.

HABITAT.—Northern Himalayas.

DISTRIBUTION.—The type specimens were taken at Gogra, Changchenmo, at 15,000 feet elevation, in Ladak, and at the Karatagh Lake, on snow, 16,890 feet elevation, in Yarkund, by the late Dr. F. Stoliczka, during the Indian Government Mission to Yarkund in 1873. In Mr. J. H. Leech's collection are specimens of both sexes from the Kardong Pass, 14,000 feet, in Ladak, taken in August; from the Digba Pass, 15,000 feet, taken in June, and from the Karakorum, 18,000, taken in July by Capt. McArthur. Examples are in the British Museum from W. Tibet, taken by Capt. Colomb. Mr. P. W. Mackinnon says of it, "Very rare, specimens only obtained on the Nilang Pass, 15,000 feet elevation, in July" (Journ. Bombay N. H. Soc. 1898, 375). Mr. W. Doherty records it from "near Kalapani, Nepalese Tibet, at 14,000 feet elevation, and near Hindi, Chinese Tibet, 15,000 feet elevation. The prehensores are quite different from those of *Kaschmirensis*" (J. As. Soc. Beng. 1886, 122). Mr. H. J. Elwes records it from the "Eastern frontier in Chumbi or Bhotan" (Tr. Ent. Soc. 1888, 363). In the "Sikkim Gazetteer," 1894, 145, it is recorded by Mr. L. de Nicéville as having been "obtained by native collectors only, probably on the other side of the Passes, in Tibet."

CHINA AND JAPAN SPECIES.—*Aglais Connexa* (Vanessa Connexa, Butler, P. Z. S. 1881, p. 851. Leech, Butt. China, etc., i. p. 258 (1893). *Habitat.* Japan.—*Aglais Chinensis* (Vanessa Chinensis, Leech, Butt. China, etc., p. 258, pl. 25, fig. 1, ♀ (1893). *Habitat.* W. China.

### Genus KANISKA.

IMAGO.—Wings rather short and broad. Male. *Forewing* triangular; costa much arched from near the base; apex obtusely pointed; exterior margin slightly oblique, scalloped, angulated outward below the apex and obtusely angled at end of lower median veinlet; costal vein extending to nearly two-thirds the margin; first and second subcostal branches emitted before end of cell; upper discocellular short, middle discocellular concave, lower very oblique and slender. *Hindwing* triangular; anterior margin broadly lobate at the base and thence oblique to the end; exterior margin obliquely convex, scalloped, very slightly excavated below the apex, and with a broad caudate angle at end of upper median veinlet; anal angle lobate; precostal vein bent outward near end; costal vein extending to apex; discocellulars outwardly oblique, lower slender. *Body* very robust; palpi ascending to level of vertex, flattened at the sides and beneath, thickly clothed with short coarse hairy-scales, with a dense ridge of longer hairy-scales on upper edge of second and third joint, edges beneath also hairy. Fore tibiae and tarsi, in male, densely clothed with short hairy-scales

above and laterally with very fine long silky-outspread hairs; femur with shorter hairs beneath. Fore tibiæ, in female, clothed less thickly with short hairy-scales above and laterally with fewer and shorter fine hairs, tarsus more roughly scaly and with a few short fine hairs only, terminal joints quite apical, their lateral spines short, but stout. Antennæ with a stout cylindrical club. Eyes hairy.

LARVA.—[Haronica]. Somewhat robust; segments armed with longitudinal rows of branched-spines; anal segment slightly humped.

PUPA.—Robust; abdominal segments with two dorsal rows of small pointed tubercles; thorax angular; head-piece produced and bifid.

TYPE.—K. Canace.

NOTE.—The shape of the wings in this genus is similar to that of *Polygonia*, as is also the character and position of the markings on the underside, the markings of the upperside are, however, very different from those in *Polygonia*.

**KANISKA CANACE** (Plate 315, fig. 1, 1a, ♂ ♀).

*Papilio Canace*, Johanssen, Amæn. Acad. vi. p. 406 (1764). Linnæus, Syst. Nat. xii. ed. p. 779 (1767).

*Vanessa Canace*, de Nicéville, Butt. of India, etc., ii. p. 231 (1886). Mackinnon, Journ. Bombay Nat.

Hist. Soc. 1898, p. 375.

*Nymphalis Canace*, Kirby, Catal. D. Lep. App. p. 648 (1871).

IMAGO.—Male. Upperside rich deep blue-black, somewhat glossy, the basal area suffused with dark sap-green; cilia black, alternated with white. Forewing with a pale greyish-blue short outwardly-oblique upper-discal band and a transverse outer-discal broad lunular recurved band gradually decreasing in width upward, being slender and brokenly speckled above the median and ending in a small subapical angular spot on the costa; in some specimens a black dot is present in the two lower lunules; outer border with two very ill-defined marginal blue-speckled slender lunular lines; costal edge striated with pale blue. Hindwing with a transverse outer discal broad pale greyish-blue band gradually decreasing in width upward and bearing an outwardly-placed series of very small black spots between the veinlets; the two outer marginal blue-speckled lines ill-defined. Underside beautifully variegated, the ground-colour being more or less bright brownish-ochreous, the basal two-thirds prominently edged by a discal black zigzag line, and the outer lunular borders dark greyish-brown or sap-brown, and numerously covered throughout, except at the apices, with short black, violet-grey, and ochreous strigæ; normal cell-marks with brownish-ochreous or grey centres; a small ochreous-white spot at lower end of each cell, the one on the hindwing being the largest and dentate; an outer discal row of black dots, those on the forewing enclosed more or less in a circular area of the ground-



colour and forming obscure ocelli. In some specimens the ground-colour is uniformly purpurescent ochreous-brown and striated with black.

Female. Upperside as in the male, the greyish-blue bands somewhat broader. Underside as in male. *Body* olivescens blue-black, beneath and forelegs dark grey; middle and hindlegs brownish-ochreous; antennæ black above, reddish-ochreous beneath; eyes reddish.

Expanse, ♂  $2\frac{1}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{6}{10}$  to 3 inches.

LARVA.—“Segments alternately orange and white, with numerous black spots on the orange segments, and black streaks on the white; seven white branching black-tipped spines on each orange segment.

PUPA.—Variegated reddish-brown with frontal gold and silver spots; head produced and bifid.” (G. F. Hampson, J. A. S. Beng. 1888, 355.)

HABITAT.—W. and E. Himalayas; Malda; Assam; S. India; Burma.

DISTRIBUTION AND HABITS.—“This very beautiful insect occurs throughout the Himalayas, Bholahat, Malda, in Assam, and in Burma. It is also found in the hills of South India. It has a swift flight, and in the Simla Hills is often found in the bed of a stream, up and down which it flies within a certain limited distance, often settling on a stone with open wings. It frequents paths in forests, occasionally settling on the ground with open wings; if disturbed it settles with closed wings on the bark of a tree, where its rich dark colouring completely hides it” (de Nicéville, *l.c.* p. 232). We possess specimens from Kashmir; Thundiani, taken in September by Col. J. W. Yerbury; Kasauli; Nepal; Khasias, Nilgiris; Wynaad; Shevaroy Hills, and Travancore. Capt. A. M. Lang, in his MS. Notes on the butterflies of the Western Himalayas, says, “This is a thorough forest insect, of swift flight. It is a handsome butterfly on the wing, flashing past, now in the deep shade of the Oak and Rhododendron, now in the broad sunlight, it gleams all blue as a sapphire.” Capt. H. B. Hellard took it in “August and September, in Masuri, the Buspa Valley, and in Kashmir” (MS. Notes). “It is common at Murree in August and September; found along this Hill as far as Thundiana, also at Dewal. It is fond of pitching on the trunks of trees, particularly of the Ilex when the tree has been wounded and the sap is exuding” (Col. J. W. Yerbury, P. Z. S. 1886, 361). It is “common in Masuri and in the interior from May to December. A few also taken in the Dun in October” (P. W. Mackinnon, J. Bombay N. H. S. 1898, 375). Mr. W. Doherty obtained it in “Kumaon generally from 2500 to 8000 feet elevation. Rather rare” (J. As. Soc. Beng. 1886, 122). Mr. H. J. Elwes records it as occurring in “Sikkim, but never commonly, up to 5000 to 6000 feet elevation, during the greater part of the year” (Tr. Ent. Soc. 1888, 362). Mr. G. F. Hampson obtained it in the “Nilgiris, at 3000 to 7000 feet elevation,” and describes both the larva and pupa (J. As. Soc. Bengal, 1888, 355). Col. C. H. E. Adamson records it as “common at Bhamo, Upper Burma,

from October to February, but rarer in the further South" (List Burmese Butt. 1897, 25). Dr. N. Manders found it "not uncommon and widely distributed throughout the Shan States, Burma" (Tr. Ent. Soc. 1890, 525).

**KANISKA HARONICA** (Plate 315, fig. 2, *larva* and *pupa*, 2a, b, ♂ ♀).

*Vanessa Haronica*, Moore, Proc. Zool. Soc. 1879, p. 137; Lep. of Ceylon, i. p. 49, pl. 25, fig. 2, ♂, fig. 2a, *larva* and *pupa* (1881). de Nicéville, Butt. of India, etc., ii. p. 232 (1886).

**IMAGO.**—Male and female. Upperside deep blue-black; basal areas suffused with dark sap-green. *Forewing* with a greyish-blue continuous curved band medially disposed across the disc, broader than in *Canace*, its upper end being formed by the similar placed upper-discal oblique band of the latter species; a small bluish-white costal lunule before the apex, with a few blue scales scattered marginally below it. *Hindwing* with the greyish-blue band also medially-disposed across the disc, and having a parallel row of small blue-speckled spots disposed beyond its outer border; two slightly-defined blue-speckled marginal lines. Underside beautifully variegated, as in *Canace*, but with all the markings brighter and more distinctly defined.

Expanse, ♂  $2\frac{5}{10}$ , ♀  $2\frac{8}{10}$  to  $3\frac{2}{10}$  inches.

**LARVA.**—Light red; spotted with black, the segments divided by blackish and purple lines; anal segment slightly humped; segments armed with eight longitudinal rows of yellow branched-spines; head and legs black. Feeds on *Smilax*.

**PUPA.**—Reddish-brown; abdominal segments with two dorsal rows of small reddish pointed tubercles; thorax angular; head-piece produced and bifid.

**HABITAT.**—Ceylon.

**DISTRIBUTION.**—"Found in hilly country from 2000 to 6000 feet elevation. Very common on pathways or roads bordered by jungle. Occurs all the year round. Larva feeds on the wild yam" (F. M. Mackwood, MS. Notes). Capt. Wade also took it in the "Kottawa Forest, Galle, also at Kandy" (Lep. Ceylon, 49).

**INDO-MALAYAN SPECIES.**—*Kaniska Charonia* (Pap. *Charonia*, Drury, Illust. Exot. Ent. i. pl. xv. fig. 1, 2 (1770). Cramer, Pap. Exot. i. pl. 47, fig. A-C (1775). Herbst, Pap. pl. 160, fig. 1, 2 (1794). *Vanessa Charonia*, Godt. Enc. Méth. ix. p. 308 (1819). Kirby, Catal. D. Lep. p. 183 (1871). Elwes, P. Z. S. 1881, p. 898. *Syn.* Pap. Kollina, Meerburgh, pl. 43 (1775). Van. *Canace*, Leech, Butt. China, etc., i. p. 225 (1893). *Habitat.* S. China; Tonkin; Hongkong.—*Kaniska Japonicum* (Pap. No-Japonicum, Siebold, Diss. Hist. Nat. Japon, p. 16 (1824). *Nymphalis* No-Japonicum, Kirby, Catal. D. Lep. Suppl. p. 732 (1878). Van. *Glaucania*, Motschulsky, Etudes Ent. ix. p. 128 (1860). Van. *Canace* (part). Leech, *l.c.* p. 225 (1893). *Habitat.* Japan; Corea.—*Kaniska Perakana* (*Vanessa Perakana*, Distant, Rhop. Malay. p. 430, pl. 40, fig. 1, ♀ (1886). *Habitat.* Malay Peninsula.—*Kaniska*

*Battakana* (Vanessa Battakana, de Nicéville, Journ. Asiat. Soc. Bengal, 1895, p. 428, ♂ ♀. *Habitat.* N.-E. Sumatra.—*Kaniska Benguetana* (Vanessa Benguetana, Semper, Reis. Phil. Lep. p. 122, pl. 21, fig. 11, 12, ♂ (1888). *Habitat.* Luzon, Philippines.

### Genus POLYGONIA.

*Polygonia*, Hübner, Verz. bek. Schmett. p. 36 (1816). Scudder, Butt. E. U. S. i. p. 309 (1889).

Kirby, Allen's Nat. Hist. Butt. i. p. 86 (1894).

*Comma*, Rennie, Consp. Butt. p. 8 (1832).

*Grapta*, Kirby, Faun. Bor. Amer. iv. p. 292 (1837). Stephens, Catal. Brit. Lep. B. M. p. 12 (1850).

Stainton, Manual Brit. Butt. i. p. 40 (1857). Staudinger et Schätz, Exot. Schmett. ii. p. 124 (1887).

IMAGO.—Male. *Forewing* somewhat elongated and narrow, subtriangular; costa slightly arched from near the base and thence straight to near the end, the apex pointed; exterior margin slightly oblique and anteriorly produced obliquely-outward below the apex into a prominent broadly-projecting angle, below which the margin is concave and sinuous, and with a broader projecting angle at end of the lower median veinlet; posterior margin much recurved; costal vein extending to more than half the margin; first subcostal branch emitted at about one-fourth before end of the cell, second at one-eighth before; discocellulars oblique, upper discocellular extremely short, middle concave, lower discocellular straight, slender; median veinlets wide apart; submedian vein slightly recurved. *Hindwing* short, broad, triangular; anterior margin basally lobate and slightly arched towards the apex; exterior margin very oblique, sinuous, excavated below the apex, broadly angular at end of first subcostal, and with a prominent projecting rounded caudate-angle at end of upper median veinlet; anal angle also projected; precostal vein slightly bent or curved outward near tip; cell closed by a slender discocellular veinlet. *Body* very stout; palpi porrect, extending two-thirds beyond the front, compressed at the sides and beneath, densely clothed throughout with rather short hair-scales, the middle and lower joint slightly fringed beneath with fine long hairs, and the middle joint above more densely with stouter hairs; fore tibiæ and tarsi, in the *male*, laxly scaly above, the sides rather thickly clothed with laterally-spreading long, very fine silky hairs; femora beneath with less numerous fine silky hairs; fore tibiæ and tarsi, in the *female*, laxly scaly above, the sides less thickly clothed with shorter silky hairs, apical joints with short stout spines; antennæ with a short stout club; eyes hairy.

LARVA.—Head subquadrate, minutely hairy, vertex slightly depressed in middle, each lobe surmounted with a short tubercular horn, the tip of which is set with hard

spiny-warts; second segment with a transverse row of bristly-warts; third to last segment armed with seven rows of branched-spines.

PUPA.—Head rather flat, with two prolonged straight points in front; back of thorax sharply raised to a thin squared central projection; waist hollowed; abdomen with a bold dorsal curve; a subdorsal row of nine small points; wing-cases prominent, shoulders angulated, their lower ends humped (Buckler).

TYPE.—P. C-album.

### POLYGONIA VAU-ALBUM (Plate 317, fig. 3, 3a, ♂).

*Papilio Vau-Album*, Denis et Schieffermüller, Wien. Verz. p. 176 (1776). Fabricius, Mant. Ins. ii. p. 489 (1787). Hübner, Eur. Schmett. i. fig. 83, 84 (1793). Ochsenheimer, Schmett. Eur. i. pt. i. p. 112 (1807).

*Pap. Polychloros*, Cramer, Pap. Exot. iv. pl. 330, fig. C, D (1782), *nee* Linn.

*Pap. L. album*, Esper, Schmett. i. pt. ii. pl. 62, fig. 3, a, b (1780).

*Vanessa Vau-album*, Godart, Enc. Méth. ix. p. 306 (1819). de Nicéville, Butt. of India, etc., ii. p. 236 (1886).

*Nymphalis Vau-album*, Kirby, Catal. D. Lep. Suppl. p. 773 (1877).

IMAGO.—Male and female. Upperside deep fulvous; cilia black, alternated with white. *Forewing* with a black constricted spot obliquely across middle of the cell, a large quadrate spot at its end, extending from the costa to upper median veinlet, and bordered on each side with a pale yellow diffused costal patch, a discal quadrate black spot between upper and middle median veinlets, two black spots between the middle and lower medians, and two wider separated spots between the lower median and submedian vein; the basal area and posterior margin sprinkled with olivescent-fusca scales; a broad black apical patch bearing an outer pure white costal spot; the outer margin broadly black and traversed by two indistinct ochreous lines. *Hindwing* with a large irregularly-quadrate black spot extending from middle of the costa to discoidal veinlet and outwardly bordered by a quadrate white spot; outer margin with a broad decreasing black band enclosing a more or less distinct series of small rounded spots paler than the ground-colour, the extreme outer margin being dark fulvous and traversed by two ochreous lines, the inner one most distinct. Underside more or less dusky brownish-ochreous or ochreous-brown. Both wings with the basal half dark ochreous-brown and transversely marked more or less with dense-black or dark-brown strigæ, its discal edge sharply defined by a very irregular angulated black line; the discal area less numerously marked with paler brown irrorations and strigæ, and traversed by an outer series of black dots; the outer margins sinuously dark brown, with a medial inner black band bearing a bluish line and two outer indistinct pale ochreous lines. *Forewing* also with a short

dark brown basal oblique cell-streak and a zigzag bar across middle of the cell, the latter with its upper end outwardly white bordered; outer edge of the discal angulated line also white bordered; the apical spot beyond also white. *Hindwing* with a small prominent pure white widely-spread V-shaped mark at lower end of the cell. *Body* above olivescence-brown, beneath brown; palpi above black, sides and beneath edged with ochreous-white; legs blackish above, ochreous-white beneath; antennæ black above, beneath and tip ochreous.

Expanse, ♂  $2\frac{6}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{8}{10}$  inches.

HABITAT.—Kashmir; Chitral; N. Asia; C. Russia; E. Europe.

DISTRIBUTION.—“Dr. T. C. Jerdon took two fine specimens at Gulmurg, 9000 feet elevation, in Kashmir. It has also been taken at Sonamurg, Kashmir” (de Nicéville, *l.c.* 236).

Our illustration on Plate 317, fig. 3, 3a, is from a Kashmir male in our own collection.

#### POLYGONIA C-ALBUM.

*Papilio C-album*, Linnæus, Syst. Nat. x. ed. p. 447 (1758). Esper, Schmett. i. pl. 13, fig. 3 (1777); *id.* pl. 59, fig. 3 (1780). Hübner, Eur. Schmett. i. fig. 92, 93 (1794).

*Vanessa C-album*, Godart, Enc. Méth. ix. p. 302 (1819). Herr. Schäffer, Eur. Schmett. i. fig. 159, 160 (1844). de Nicéville, Butt. of India, ii. p. 237 (1886).

*Nymphalis C-album*, Kirby, Catal. D. Lep. Suppl. p. 732 (1877).

*Wet-season form* (Plate 318, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male. Upperside deep bright fulvous-red; cilia black, alternately edged with fulvous-grey. *Forewing* with two deep black rounded spots obliquely across middle of the cell, a large quadrate discocellular streak extending from the costa to upper median, three discal oblique quadrate spots, and a subapical black patch decreasing from the costa to near upper median; outer margin black and linearly speckled outwardly with fulvous-grey scales, and bordered inwardly by a series of yellow dentate spots. *Hindwing* with the costal base broadly black, and the outer margin very broadly fulvescent-black, the latter traversed by a row of five distinct yellow small dentate spots; abdominal border greyish-brown; a black quadrate spot at end of the cell, a larger spot above it between the subcostals, and a much smaller spot between the upper and middle medians. Underside with the basal area and outer marginal border greyish sepia-brown; the discal area dark grey, divided from the dark base by a sharply-defined broken irregular black line; outer areas and base of hindwing numerously covered with fine black strigæ; discal area traversed by a very indistinct row of blackish dots. *Forewing* also with an oblique black loop-mark from lower base of cell, some black strigæ from the costa, and a black lunular streak between the angles of the outer margin. *Hindwing* also with a prominent white comma-shaped mark at end of the cell.

Female. Upperside as in the male, except that on the forewing the discocellular black streak is broader, and the subapical streak fulvous posteriorly; and in the hindwing the marginal dentate yellow spots are somewhat larger. Underside as in the male; the outer area duller grey, the strigæ less prominent, and the white comma-shaped mark more or less ill-defined.

Expanse, ♂  $2\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

*Dry-season form* (Plate 318, fig. 2, d, e, ♀).

Male and female. Upperside fulvous-yellow; markings as in the wet-season form, but the black spots somewhat smaller and less sharply defined, the yellow dentate spots also less defined. Underside paler than in wet-season form, the ground-colour being dull ochreous greyish-brown; markings similar.

Expanse, ♂  $1\frac{2}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—Europe; Asia Minor; Persia; Western Himalayas.

DISTRIBUTION WITHIN OUR AREA.—We possess specimens of the *wet-season* form from Gulmurg and Sunamurg, Kashmir, taken by Capt. A. M. Lang, and of the *dry-season* form from Kashmir, taken by Capt. R. Bayne Reed. Capt. Lang records it as “apparently common at Gulmurg, Kashmir” (Ent. Monthly Mag. 1868, 34). Mr. J. H. Leech has specimens from Kylang, 13,000 feet elevation, taken by Capt. MacArthur in September, from Gurais Valley, 7000 feet, Kashmir, taken by himself in September; from Dugi Pass, 12,000 feet elevation, near Karakorum, taken in August and September by Capt. Thompson.

Of our illustrations on Plate 318, figs. 2, 2a, b, c, are from *wet-season* male and female Kylang specimens in Mr. Leech’s collection, and figs. 2d, e, from *dry-season* female from Kashmir, taken by Capt. Reed.

### POLYGONIA COGNATA.

*Wet-season form* (Plate 319, fig. 1, 1a, ♂).

IMAGO.—Male and female. Upperside similar to, but of a paler fulvous than, *C-album*, as here described. *Forewing* with the cell spot united and larger, the discocellular streak broader, the lower discal spot larger and with a small speckled-spot above it. *Hindwing* with the discal spots larger; the outer marginal band broader, more uneven on its inner edge and traversed by an almost continuous series of narrow yellow lunules. Underside with the ground-colour throughout uniformly dark greyish sepia-brown, the strigæ less sharply defined, white comma-shaped mark prominent.

Expanse, ♂ 2, ♀  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 319, fig. 1, b, c, d, ♂ ♀).

Male and female. Upperside fulvous-yellow; markings as in wet-season form; the black markings less sharply defined, the marginal bordering yellow dentate spots on the forewing less distinct, and the yellow lunules on the hindwing broad and continuous. Underside with the ground-colour dull yellowish-ochreous or pale brownish-ochreous, the markings dark ochreous-brown; comma-shaped mark prominent.

Expanse, ♂ 2, ♀  $2\frac{2}{10}$  inches.

HABITAT.—Western Himalayas; Kashmir, Kunawur, Kumaon.

DISTRIBUTION.—We possess specimens of the *wet-season* form from Thundiani, taken by Col. J. W. Yerbury in September; from Kashmir, taken by Major H. B. Hellard in August and September, and also both sexes of the *dry-season* form from the Simla Hills, Kunawur, taken by Capt. A. M. Lang, and from Kashmir, taken by Capt. Magee. Specimens from Thundiani are also in the collection of the British Museum and of Col. Swinhoe. Capt. A. M. Lang refers to this species under *C-album*, as “occurring rarely in Kumaon, where he took it at several localities far apart, and of divers altitudes and climates. One fine specimen was taken on the bleak Hungrung Pass at about 15,000 feet elevation, while others were taken 200 miles away on the lower well-wooded ranges of the Simla District” (Ent. Mo. Mag. 1868, 34). Col. J. W. Yerbury took his specimens at “Thundiani, a Hill Station near Abbottabad, at about 8700 feet elevation, in August and September. It affects the Yarrow and Ragwort” (Ann. Nat. Hist. 1888, 139). Mr. W. Doherty probably refers to this species, under *C-album*, as being taken by him at “Khati, N.W. Kumaon, at 8000 feet elevation” (J. A. S. Beng. 1890, 122). Mr. J. H. Leech has it from Sultunpur, Kulu, taken by Capt. Graham Young.

### POLYGONIA AGNICULA.

*Grapta Agnicula*, Moore, Proc. Zool. Soc. 1872, p. 559 (♂ only).

*Nymphalis Agnicula*, Kirby, Catal. D. Lep. Suppl. p. 733 (1877).

*Vanessa C-album*, var. *tibetana*, Elwes, Trans. Ent. Soc. 1888, p. 363, pl. 10, fig. 1, ♂.

*Vanessa C-album* (part), de Nicéville, Butt. of India, etc., ii. p. 237 (1886).

*Wet-season form* (Plate 319, fig. 2, 2a, ♂).

Male and female. Upperside bright clear fulvous-red. *Forewing* with prominent black markings disposed as in Kashmir *C-album*, the two cell-spots being well-separated and small, the marginal black band slightly speckled outwardly with fulvous-grey scales, the inner row of yellow dentate spots, seen in *C-album* and *cognata*, are absent. *Hindwing* with three black discal spots, the two lower being

well isolated, the costal border black; the marginal black band traversed by broad lunules of the same bright fulvous as the ground-colour, and also outwardly speckled with fulvous-grey. Underside greyish sepia-brown, brownest on the basal areas, the outer areas numerously covered with very fine black strigæ and traversed by a discal row of slightly-perceptible black dots with pale borders; comma-shaped mark slender.

Expanse, ♂ ♀, 2 to  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 319, fig. 2, b, c, ♂).

Upperside clear fulvous-yellow; of a uniform tint throughout; marginal lunules on the hindwing of the same colour; black markings somewhat larger. Underside dark ochreous-brown, darker throughout than in *wet* form of *cognata*.

Expanse, 2 inches.

HABITAT.—Nepal; Chumbi, Sikkim; N. W. Bhotan.

DISTRIBUTION.—The type specimens of *agnicula* were taken at Katmandu, in Nepal, by the late Major-Gen. G. Ramsay. Mr. H. J. Elwes records his type of *tibetana* as having been taken by native collectors in Chumbi and N. W. Bhotan (Tr. Ent. Soc. 1888, 363). Mr. W. Doherty (J. A. S. Beng. 1886, 122) records *agnicula* as having been taken by himself on the Pindari Glacier, 12,000 feet elevation, and Byans Valley, in Eastern Kumaon, 12,000 to 15,000 feet elevation, and remarks, "These species (*C-album* and *Agnicula*) are closely allied, but I have been able to separate my own specimens by means of slight differences in the prehensores, as well as by the shape and colouring."

Our illustrations of this species on Plate 319, figs. 2, 2a, are from a Nepal type of *Agnicula* (*wet-season* form); and figs. 2b, c, from a male *dry-season* form, from Chumbi, kindly given to me by Mr. Elwes.

#### POLYGONIA INTERPOSITA (Plate 318, fig. 1, 1a, ♂, ♀).

*Vanessa interposita*, Staudinger, Stettin Entom. Zeit. 1881, pp. 286-7.

*Vanessa Egea*, de Nicéville, Butt. of India, etc., ii. p. 237 (1886), *nec* Cramer.

IMAGO.—Male and female. Upperside deep dusky-fulvous; cilia black and alternately edged with grey. *Forewing* with two outwardly-oblique superposed small black spots across middle of the cell, a broad black discocellular streak at its end extending from the costa to upper median veinlet, and three discal inwardly-oblique small spots, the upper two being much the smallest in the male, and the upper one almost obsolescent; a dusky-castaneous oblique patch before the apex, its costal end being broadly black; a broad blackish outer-marginal border very indistinctly



traversed by a fine dusky fulvous line and inwardly bordered by a series of small yellowish dentate spots disposed between the veins. *Hindwing* with the costal base broadly dull greyish-black, the outer margin broadly dull greyish-black anteriorly merging to dark fulvous-brown posteriorly, and traversed by a row of five small yellowish dentate spots; the costal interspace between the dark basal border and the outer band being grey-speckled; at the upper end of the cell is a small narrow black spot, and a larger black spot above it between the subcostals. Underside. Both wings pale purpurulent greyish-brown, darkest basally and on outer borders; numerous covered with transversely disposed fine black strigæ, which are most conspicuous across the disc. *Forewing* also with the discal strigæ separated from the dark basal area by an irregular black discal line, and from the outer margin by a narrow black lunular medial fascia speckled with greenish-grey scales, and two upper series of black dentate marks and a lower inner series of similar marks; from the lower base of the cell extend two oblique fine black looped-lines. *Hindwing* also with the discal strigæ separated from the basal dark area by a slender black interrupted line, which is bent upward above the anal angle and thence extends angularly up the abdominal margin; the outer margin traversed by a series of black dentate marks speckled with greenish-grey scales; at lower end of the cell is a pure white angled-mark like an oblique letter L. *Body* and palpi above olivaceous-brown, beneath and legs pale brownish-grey; palpi externally edged with black; front and middle legs lined with black above; antennæ black above, ochreous beneath.

Expanse, ♂  $1\frac{7}{10}$ , ♀  $2\frac{1}{10}$  inches.

HABITAT.—Persia?; Beluchistan; Chitral; Turkestan.

The above description and figures are taken from Chitral specimens in the collection of Mr. H. Grose-Smith, and differ from South European and Asia Minor examples of *Egea* in having the ground-colour of the upperside darker, the markings and marginal bands also being darker. A male, from Turkestan, in Mr. J. H. Leech's collection, agrees perfectly with the above. A female, from Quetta, Beluchistan, taken at 6500 feet elevation, and described by Mr. de Nicéville (*l.c.* p. 237) is stated to "differ from European examples of *Egea* in lacking the two round black spots on the disc of the forewing on the upperside, but there are traces of these spots, there being spots in their place of a deeper shade of fulvous than the ground-colour."

INDO-MALAYAN SPECIES.—*Polygonia C-aureum* (Pap. C-aureum, Linn. Syst. Nat. i. p. 477 (1758). *Syn.* Pap. Angelica, Cram. iv. pl. 388, fig. G, H (1782). *Habitat.* China, Formosa, Japan.—*Polygonia Bockii* (Grapta Bockii, Rothschild, Nov. Zool. i. p. 535, pl. 9, fig. 7 (1894). *Habitat.* W. China.—*Polygonia Pryeri* (Vanessa Pryeri, Jansen, Cist. Ent. ii. p. 269, pl. 5, fig. 2 (1878), Leech, Butt.

China, etc., i. p. 267, pl. 25, fig. 4, ♂. *Habitat.* Japan.—*Polygonia Fentoni* (Van. Fentoni, Butler, Cist. Ent. ii. p. 281 (1878). *Habitat.* Japan.—*Polygonia lunigera* (Van. lunigera, Butler, P. Z. S. 1881, p. 850. *Habitat.* Japan.—*Polygonia Hamigera* (Van. Hamigera, Butler, Ann. Nat. Hist. 1877, p. 92. *Habitat.* Japan.—*Polygonia gigantea* (Grapta gigantea, Leech, Ent. 1890, p. 189; Butt. China, etc., i. p. 263, pl. 25, fig. 6, ♀ (1893). (*Wet-season form.*) *Syn.* *Polygonia extensa* (Grapta C. album, var. *extensa*, Leech, Butt. China, etc., i. p. 265, pl. 25, fig. 5, ♀ (1893). (*Dry-season form.*) *Habitat.* W. and C. China,

### Genus VANESSA.

- Vanessa*, Fabricius, Syst. Gloss (Illiger's Mag. vi. p. 281 (1807). Latreille, Consid. Gén. p. 440 (1810). Hübner, Verz. Schmett. p. 33 (1816). Curtis, Brit. Ent. pl. 96 (1825). Scudder, Syst. Rev. Amer. Butt. p. 2 (1872); *id.* Butt. E. U. S. i. p. 430 (1889).  
*Pyrameis*, Hübner, Verz. Schmett. p. 33 (1816). Doubleday and Hewits. Gen. D. Lep. p. 202 (1849). Stephens, Catal. B. Lep. B. M. p. 11 (1850). Moore, Lep. Ceylon, i. p. 49 (1880). Staudinger et Schütz, Exot. Schmett. ii. p. 125 (1887). Kirby, Allen's N. H. Butt. i. p. 96 (1894).  
*Bassaris*, Hübner, Exot. Schmett. ii. *id.* Index, p. 4 (1816–21).  
*Ammiralis*, Rennie, Consp. Butt. p. 10 (1832).  
*Cynthia*, Stephens, Illust. B. Ent. Haust. i. p. 47 (1827). Rennie, Consp. p. 10 (1832). Westwood, Brit. Butt. p. 56 (1841). Stainton, Manual Brit. Butt. i. p. 36 (1857).  
*Phanessa*, Sodoffsk. Bull. Mosc. x. p. 80 (1837).  
*Neopyrameis*, Scudder, Butt. E. U. S. i. p. 434 (1889).

IMAGO.—Male. *Forewing* triangular; costa slightly arched, exterior margin oblique and slightly angular below the apex, scalloped; posterior margin straight; costal vein extending to two-thirds the margin; first and second subcostal branches emitted at equal distances close before end of the cell, third at nearly half length beyond, fourth and fifth at two-thirds beyond; upper discocellular very short, middle short and curved outward, lower discocellular long, slender, recurved obliquely outward; radials from angle near subcostal and end of middle discocellular; cell broad; middle median emitted at one-fifth before lower end of the cell, lower at one-half its length; submedian vein almost straight. *Hindwing* short, triangular; exterior margin convex, scalloped, abdominal margin long; costal vein extending to apex; precostal vein bent abruptly outward, emitted at a short distance beyond base of subcostal; first subcostal branch emitted at two-thirds from its base; upper discocellular slightly convexly-oblique, lower slender, very oblique and straight; radial from end of upper discocellular; cell broad; two upper median branches from end of cell, lower at one-third before its end and opposite second subcostal; submedian

recurved; internal vein recurved from the base. *Body* stout, abdomen short; palpi porrect, compactly clothed with short appressed hairs at sides and beneath, second joint long and projecting half its length beyond the head, third joint short, pointed; fore tibiæ and tarsi in the *male* somewhat scaly above, the sides very densely clothed with laterally spreading long coarse silky hairs, femora beneath with less numerous shorter hairs; fore tibiæ and tarsi, in the *female*, somewhat scaly above, the sides less densely clothed with long coarse silky hairs, apical joints spined; antennæ long, with a short thick cylindrical club; eyes hairy.

LARVA.—Cylindrical, delicately hairy; armed with a dorsal and five incomplete lateral rows of branched-spines; head slightly subquadrate, vertex depressed in middle, regularly covered with minute tapering warts; hairy.

PUPA.—Head-piece obtuse, bluntly cleft; thorax dorsally raised and angled near the middle; abdomen dorsally arched, and with a dorsal row of conical points and lateral rows of lesser points.

TYPE.—V. *Atalanta*.

**VANESSA INDICA** (Plate 320, fig. 1, 1, a, b, ♂ ♀).

*Papilio Atalanta Indica*, Herbst, Nat. Schmett. vii. p. 171, pl. 180, fig. 1, 2 (1794).

*Pyrameis Indica*, Kirby, Catal. D. Lep. p. 185 (1871). Moore, Lep. of Ceylon, i. p. 50, pl. 27, fig. 2 (1881). de Nicéville, Butt. of India, ii. p. 229, pl. 18, fig. 74, ♀ (1886).

*Papilio Atalanta*, Cramer, Pap. Exot. i. pl. 84, fig. E, F (1775), *nec* Linn.

*Hamadryas decora Calliroë*, Hübner, Samuel Exot. Schmett. (1806-16).

*Pyrameis Calliroë*, Hübner, Verz. bek. Schmett. p. 33 (1816). Doubleday and Hewits. D. Lep. p. 204. Moore, Catal. Lep. Mus. E. I. C. i. p. 138 (1857).

*Vanessa Calliroë*, Gray, Lep. of Nepal, p. 11 (1846).

*Pyrameis nubicola*, Fruhst. Berl. Ent. Zeit. 1898, p. 151.

IMAGO.—Male and female. Upperside. *Forewing* black, with a broad medial outwardly-oblique irregular red band, the lower portion of which is traversed by three irregular-shaped black patches; basal area and posterior margin golden-brown; an oblique inner subapical series of white quadrate spots and an outer subapical series of small white dentate spots. *Hindwing* golden-brown, with an olivescient or purplish gloss in certain lights; costal border greyish-ochreous; an outer marginal red band inwardly-bordered by black conically-lunate spots, and traversed by a row of black lunulate spots and outer marginal line. Cilia alternated with white. Underside. *Forewing* similar to upperside, except that the base of costa is striated with black, the apex broadly ochreous-brown and with two small ocelli below the white dentate spots, a partly blue and whitish marginal line, a blue-

speckled costal stripe beyond the cell, and a black patch crossed by a white bar at end of the cell. *Hindwing* beautifully marked with rich dark reddish-brown transverse sinuous fasciæ with pale ochreous borders, which are numerous speckled with greyish-white and black scales; the veins from the base also lined with greyish-white; two white-edged blackish marks within the cell and a larger similar mark beyond the cell; outer disc traversed by a series of cordiform ocellate reddish spots with blue and black-speckled centres, followed by a submarginal blue-speckled blackish lunular line and a narrower similar marginal line. Body above olivescient golden-brown; palpi above blackish, beneath pale ochreous, the sides being white; legs pale ochreous, femora beneath black-speckled with white; antennæ black above, beneath and tip reddish-ochreous.

Expanse 2 to 3 inches.

LARVA.—Head black, minutely tuberculated. Segments slightly hairy, armed with a dorsal and three lateral rows of branched-spines; spines mostly black; segments blackish, numerous covered with very small yellowish spots. (Described from preserved specimens in Coll. Hocking.)

HABITAT.—W. and E. Himalayas; Assam; Naga Hills; Burma; Bombay; Nilgiris; Ceylon; China; Japan.

DISTRIBUTION, ETC.—“This is a common species wherever the food plant, the nettle, is found. It occurs commonly in the Himalayas up to considerable elevations. I possess a curious aberration, taken in the Deyra Dun, in July, by Col. Buckley, which almost exactly agrees with a variety of the European species (*Atalanta*) figured by Herbst (pl. 180, fig. 5, 6)” (de Nicéville, Butt. Ind. ii. 229). “It is very common in the late summer and autumn months throughout the N. W. Himalayas, and hibernated specimens are met with in the spring” (*id.* Indian Agriculturist. Jan., 1880). Col. J. W. Yerbury found it “common at Thundiani, the Hill Station above Abbottabad, in May, August, and September” (Ann. N. H. 1888, 139). Capt. A. M. Lang found it “abundant in the W. Himalayas from 5000 to 10,000 feet elevation. Larvæ taken at Kasauli on nettle, in June and July” (MS. Notes). Mr. P. W. Mackinnon says it is “more common in Masuri than *Cardui*, but is comparatively rare in the Dun. The larvæ feed on different species of Urticaceæ, and is gregarious. It flies almost throughout the year” (J. Bombay N. H. Soc. 1897, 375). Major J. L. Sherwill, in his Journal of a trip in November in the Sikkim Himalayas, says this butterfly “was common at great elevations. I observed it on the snow, and on the glaciers at 13,000 feet to 16,000 feet elevation, but it was the sole inhabitant of these cold and dreary regions” (J. A. S. Bengal, 1882, 479). “Not uncommon in Sikkim, in open ground, at all seasons and elevations up to 12,000 feet elevation” (H. J. Elwes, Tr. Ent. Soc. 1888, 362). Col. C. Swinhoe records taking “several examples in Bombay in 1877” (P. Z. S.

1885, 128). Col. C. H. E. Adamson says it is "rarely taken in the Arakan Hills and at Bhamo" (List, 1897, 25). Dr. N. Manders took "one specimen at Bernardmyo, Shan States, Burma" (Tr. Ent. Soc. 1890, 524). In Ceylon, Mr. F. M. Mackwood says it is "rarely seen under 4000 feet elevation. Settles on pathways or open ground. Very swift of flight. Larvæ feeds on Nettle (*Urtica neilgherriensis*)."/> Capt. Hutchison "found it at all times in forest land, from 3000 to 6000 feet. Commonest at the highest elevation" (Lep. Ceylon, i. 50).

**VANESSA CARDUI** (Plate 320, fig. 2, 2a, b, ♂ ♀).

*Papilio Cardui*, Linnaeus, Syst. Nat. x. ed. p. 475 (1758); *id.* xii. ed. i. 2, p. 774 (1767). Esper, Schmett. i. pt. 1, pl. 10, fig. 3 (1777). Hübner, Eur. Schmett. i. fig. 73, 74 (1793).

*Vanessa Cardui*, Hübner, Verz. bek. Schmett. p. 33 (1816).

*Pyrameis Cardui*, Moore, Catal. Lep. Mus. E. I. C. i. p. 138, pl. 5, fig. 3, 3a, larva and pupa (1857); Lep. of Ceylon, i. p. 50, pl. 27, fig. 1, 1a (1881). de Nicéville, Butt. of India, etc., ii. p. 227 (1886). Staudinger et Schätz, Exot. Schmett. ii. p. 125 (1887). Leech, Butt. of China, etc., i. p. 251 (1893).

*Cynthia Cardui*, Stephens, Ill. Brit. Ent. Haust. i. p. 47 (1827). Horsfield, Desc. Catal. Lep. E. I. C. pl. 7 (1829). Westwood, Gen. Syn. p. 87 (1840). Crotch, Cist. Ent. i. p. 66 (1872).

*Neopyrameis Cardui*, Scudder, Butt. E. U. S. i. p. 434 (1889).

*Papilio Carduelis*, Cramer, Pap. Exot. i. pl. 26, fig. E, F (1775).

IMAGO.—Male and female. Upperside. Ground-colour reddish-ochreous, basal areas olivescens-ochreous-brown; cilia black, alternated with white. *Forewing* with an outwardly-oblique black irregular-shaped broken band crossing from middle of the cell to the disc above the submedian vein; the apical area from end of cell and the exterior border also black; before the apex is a short white outwardly-oblique streak and a curved row of four round spots, the second and third being small; a marginal pale lunular line with its upper portion most defined and whitish. *Hindwing* with a blackish patch from the costal vein across end of cell, a partly confluent recurved discal band, a submarginal row of lunules, and then a marginal row of somewhat scutiform spots; between the discal band and submarginal lunules is a row of five round black spots, which in some examples show a pale and dark outer ring. Underside. *Forewing* brighter reddish-ochreous, the apical area and outer margin much paler, the apex being olivescens ochreous-brown; discal irregular band as above, subapical white streak, row of spots and marginal lunules distinct; base of wing and interspace before end of cell white. *Hindwing* transversely marbled with olivescens ochreous-brown and speckled with black scales; crossed by basal and discal sinuous whitish or pale fasciæ and intersected by white veins; an outer-discal row of five ocelli, the upper one smallest and usually imperfect, the

second and fifth the largest, the fourth with black centre speckled with blue and ringed with yellow, and the second and fifth also with an outer black ring; submarginal lunules purpurescent-grey, bordered by a whitish fascia; outer margin ochreous. *Body* olivescient ochreous-brown, abdomen with ochreous bands; palpi blackish above, white beneath; body beneath and legs greyish-white; antennæ black above, tip and beneath reddish.

Expanse,  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

LARVA.—“*After first moult*; three-quarters of an inch long; ground-colour olive-brown, variegated with brown; dorsal line double, interrupted and white; lateral line faint, interrupted and red-brown; sides pale slate colour, and very spiny; abdomen pale slate colour, ventral line darker; prolegs slate colour; thoracic legs black and shiny; anal pair slate colour; head black and spiny; stigmata white, bordered with black; armed with five rows of slate coloured branched-spines, one dorsal and two lateral. *After last moult*; length one inch. Cylindrical and spiny. ground-colour and markings as after first moult.”

PUPA.—“Golden olive-green, with a lilac iridescence; a dorsal row of protuberant gold spots, and on either side one of same, and also broad longitudinal bands of gold colour on the sides.” (Chaumette, Lucknow, MS. Notes.)

HABITAT.—Throughout India; Burma; Ceylon; Andaman and Nicobar Isles; Malay Peninsula, etc.

DISTRIBUTION, HABITS, ETC. Within our Area.—“In India this butterfly occurs almost everywhere. It is decidedly rare in Calcutta, but as far as I am aware it occurs plentifully in every other part of India and in the Hills up to a considerable elevation. It has been found in both the Andaman and Nicobar groups of Islands” (L. de Nicéville, Butt. India, ii. 228). “This is one of the first insects you will meet with in the spring, in the W. Himalayas, and the last you will see in the autumn. It is an early riser, and one of the last to go to rest. I have actually watched them follow the setting sun as its beams gradually ascended the hillsides, caused by the sun setting behind an opposite range of hills. I have taken specimens in the plains as far east as Dinapore, but [up to the present date] I have never seen any in Calcutta. It also occurs commonly in Kashmir, and I have taken it high up in Ladak” (*id.* Indian Agric. January, 1880). Capt. A. M. Lang found it “everywhere common in the Western Himalayas at all seasons, and throughout the winter months in the plains” (MS. Notes). The Rev. J. H. Hocking found the “larva on Nettle; May and August, in Kulu, at 6200 feet elevation” (P. Z. S. 1882, 240). “Very common almost throughout the year in Masuri and the Dun. Larva feeds on thistles and on *Debregeasia bicolor*, N. O. Urticacæ” (P. W. Mackinnon, J. Bombay N. H. Soc. 1898, 375). Mr. L. de Nicéville records that it was “found near Jarti Gumbaz, Pamir” (Rept. on Pamir Boundary Comm. 1898, p. 15). Col. C. Swinhoe obtained

"a few at Kandahar in October and November in 1880. It was very plentiful in March and April following. The gardens about Kandahar were alive with regular swarms of this butterfly in the last month, but I did not observe it at Quetta or anywhere else on our lines of communication between Sibi and Kandahar" (Tr. Ent. Soc. 1885, 339). At Karachi it was plentiful in several months of the year. I took it in January, February, June, July, August, and December" (*id.* P. Z. S. 1884, 505). Capt. H. L. De la Chaumette reared the "larva at Lucknow, in October, 1860, on *Guaphalium indicum*, the imago emerging on November 15th" (MS. Notes). "In Sikkim, this cosmopolitan butterfly is found throughout the year at low elevations, but more commonly in the winter. In the summer it is found up to 12,000 feet elevation" (de Nicéville, Sikkim Gaz. 1894, 144). In Bombay "it is found sparingly throughout the District. At times it appears in great numbers, continues for a week or two, and disappears again. As is well known, it is a migratory butterfly, and is known in almost every part of the world. It has a rapid, irregular flight, and is fond of settling on the ground, and on rocks. We have found larvæ in Kanara in November, feeding on *Zornia diphylla*, and on a thistle-like plant of the genus *Blumea*, which is its common food in other parts of the Presidency also" (J. Davidson and E. H. Aitken, J. Bombay N. H. Soc. 1896, 256). "The larvæ are social when very young, half a dozen living together under the shelter of a little network of silk. The butterfly is not very easy to catch, being a strong flier and wary. It rarely settles, except on the ground, and opens its wings much less than the *Junonias*" (E. H. Aitken, *id.* 1886, 131). "At different times of the year, but most often, I think, in June, large numbers of this butterfly appear about the rocks on the sea-shore, or in other barren situations, and I am inclined to think they are new arrivals from some other country. A certain number remain permanently with us, and breed on a common species of *Blumea*" (*id.* 1897, 337). In Ceylon, "it is found everywhere, but is more plentiful in the higher districts" (F. M. Mackwood, Lep. Ceyl. i. 50). "In Burma this is a rare butterfly. I took one in February near Bhamo, and one in December in North Yen. I have received it from the Chin Hills, and saw one so far South as Mandalay, in January. One was also obtained at Nimbu" (Col. C. H. E. Adamson, List, 1897, 25). Mr. W. L. Distant records it from Penang (Rhop. Malay. Preface, p. vi.). We have examples from Sumatra, Java, Formosa, and Japan. Mr. J. J. Walker, R.N., found it "not very common in Hong Kong from December to May" (Tr. Ent. Soc. 1895, 457). Mr. J. H. Leech also obtained it in China and Japan. It is also recorded from the Philippines.

INDO-MALAYAN SPECIES.—*Vanessa Dejeanii*, Godart, Enc. Méth. ix. Suppl. p. 821 (1823). Boisd. Spéc. Gén. Lep. i. pl. 10, fig. 2 (1836). *Habitat.* Java.—*Vanessa Samani* (Pryameis Samani, Hagen, Iris, vii. p. 359 (1894). *Habitat.* Sumatra.

## Genus ARASCHNIA.

*Araschnia*, Hübner, Verz. bek. Schmett. p. 37 (1816). Doubleday and Hewits, Gen. D. Lep. p. 187 (1848). Staudinger and Schätz, Exot. Schmett. ii. p. 123 (1887). Leech, Butt. China, etc., i. p. 267 (1892).

IMAGO.—Male. Wings moderately small. *Forewing* elongatedly triangular; costa very slightly arched, apex rounded, exterior margin oblique, sinuous, slightly convex below the apex, posterior margin slightly recurved; costal vein extending to about three-fifths the length; cell extending to nearly half the wing; first subcostal emitted at about one-sixth before end of the cell, short and running close to the costal near its end, and in some specimens slightly anastomosed to it close to its end; upper discocellular extremely short and outwardly-oblique, middle discocellular erect and concave, lower discocellular outwardly-oblique; middle median emitted at some distance before lower end of the cell, lower median at half distance before end of cell; submedian vein slightly recurved. *Hindwing* small, conically-triangular; anterior margin almost straight from basal lobe, apex rounded, exterior margin convex and sinuous, abdominal margin somewhat convex, anal angle pointed; precostal vein straight; radial emitted near the base of subcostal branch; cell open. *Body* moderately slender; eyes hairy; head hairy in front; palpi rather slender, third joint rather long, pointed, smooth, second joint clothed with fine longish hairs beneath and above, sides smoothly scaled; fore tarsi in male clothed with fine long silky laterally-divergent hairs; fore tarsi in female slender, smooth, joints spined at tip beneath.

LARVA.—Head with two erect branched-spines. Segments with a dorsal, and lateral rows of branched-spines.

PUPA.—Head-piece short, cleft; thorax dorsally angled; abdomen with a dorsal and a shorter lateral row of points.

TYPE.—A. *Levana*.

SEASONAL DIMORPHISM.—In the European species, *Levana* is now known to be the *spring* form and *Prorsa* the *summer* form of one species.

## ARASCHNIA DOHERTYI (Plate 320, fig. 3, 3a, b, ♂ ♀).

*Araschnia Prorsoides*, Elwes, Proc. Zool. Soc. 1891, p. 285, pl. 27, fig. 5, 6, ♂ ♀ (*nec* Blanchard).

IMAGO.—Male. Upperside dark purpurescent-brown; cilia black, alternated with ochreous-white. *Forewing* with two, or three, pale reddish-ochreous speckles within the base of the cell, a slender curved streak and two straight streaks across the middle of cell, followed by an upper wedge-shaped ochreous spot near end of the cell; below the cell is a short slender ochreous streak and an outer



obsolescent dot; across the disc are two upper-discal outwardly-oblique pale ochreous-yellow broad spots, a very small outwardly-oblique spot below, two small rounded inwardly-oblique superposed white spots which are outwardly placed above and below the upper median veinlet, followed by three lower-discal broad quadrate large ochreous spots, the lower being narrow; beyond is a submarginal irregularly-disposed series of small markings, of which the upper are macular and pale ochreous-yellow, the next a reddish-ochreous broken lunule, then a pale yellow short lunule, and lastly two lower reddish-ochreous narrow lunules. *Hindwing* crossed by a medial-discal broad pale ochreous-yellow band, and a submarginal reddish-ochreous very narrow lunular band, between which is a very slender discal broken sinuous line; base of wing with a slightly-defined pale yellow dot above the cell and two very slender curved lines across the cell. Underside. Ground-colour pale yellowish-ochreous; the discal band, as above, ochreous-white; basal irregular markings dark ochreous-red narrowly edged with yellow, the veins basally also yellow; discal area medially clouded with dark ochreous-red and traversed by an inner slender sinuous black-edged yellow line and an outer diffused yellow lunular line, followed by two marginal slender black lines; a medial series of lilacine-white dots, the middle pair on the forewing being the largest and represent those of the upperside.

Female. Upperside with markings as in the male, but somewhat broader. *Forewing* also with a small red spot beyond the cell. *Hindwing* also with an outer-discal reddish-ochreous slender lunular line. Underside similar to the male. *Body* dark olivescence-brown; palpi above black; body and palpi beneath and legs pale ochreous-white; antennæ black above, whitish beneath, tip ochreous.

Expanse, ♂ 2, ♀ 2 $\frac{2}{10}$  inches.

HABITAT.—Naga Hills.

DISTRIBUTION.—Mr. W. Doherty "found it abundantly above Mao, on the Manipur side of the Nagar Hills, at 6000 to 8000 feet elevation, in August and September, 1889, where it was common in open ground near water, the larva feeding on a species of Nettle" (H. J. Elwes, *l.c.*).

CHINA AND JAPAN SPECIES.—*Araschnia prorsoides* (Van. *Prorsoides* et *Levanoides*, Blanchard, Compt. Rend. Acad. Sci. 1871, p. 810). Leech, Butt. of China, etc., i. p. 273, pl. 26, fig. 1, 2, ♂ ♀. *Syn.* A. *Strigosa*, Alpheraky, Rom. Mem. v. p. 111, pl. 5, fig. 6 (1889). *Habitat.* W. China.—*Araschnia obscura*, Fenton, P. Z. S. 1881, p. 850. *Syn.* A. *Levana*, Leech, *l.c.* p. 269, pl. 26, fig. 9. *Habitat.* Corea; Yesso, Japan.—*Araschnia Burejana*, Bremer, Bull. Acad. Petr. (1861), p. 466; *id.* Lep. Ost-Sib. p. 15, pl. 1, fig. 8 (1864). Leech, *l.c.* i. p. 271, pl. 26, fig. 10—14 (1892). Pryer, Rhop. Nippon, p. 25, pl. 5, fig. 11 (1888). *Syn.* A. *Strigosa*, Butler, Journ. Linn. Soc. Zool. 1866, p. 54. *Habitat.* Amur Land, W. China,

Corea, Japan.—*Araschnia Doris*, Leech, *l.c.* i. p. 272, pl. 26, fig. 4, 5, ♂ ♀ (1892). *Habitat.* W. and C. China.—*Araschnia Fallax*, Janson, *Cist. Ent.* ii. p. 271, pl. 5, fig. 3 (1878). Pryer, *Rhop. Nippon*, p. 24, pl. 5, fig. 12, ♀. *Habitat.* Japan.—*Araschnia Davidis*, Poujade, *Bull. Soc. Ent. Fr.* 1885, p. 114. Oberthür, *Et. Ent.* 1890, p. 38, pl. 9, fig. 102 (1890). Leech, *l.c.* p. 274. *Habitat.* Moupin, W. China.—*Araschnia Oreas*, Leech, *l.c.* i. p. 275, pl. 26, fig. 6, ♂ (1892). *Habitat.* W. China.

### Genus SYMBRENTHIA.

*Symbrenthia*, Hübner, *Verz. bek. Schmett.* p. 43 (1816). de Nicéville, *Butt. India, etc.*, ii. p. 238 (1886). Distant, *Rhop. Malay.* p. 431 (1886). Staudinger and Schätz, *Exot. Schmett.* ii. p. 123 (1887).

*Laogona*, Boisduval, *Spéc. Gén. Lep.* i. pl. 10, fig. 3 (1836). Doubleday and Hewits, *Gen. D. Lep.* i. p. 190 (1848).

IMAGO.—Male. Wings short. *Forewing* triangular; costa slightly arched; apex obtuse, exterior margin slightly oblique and uneven, posterior margin slightly recurved; costal vein rather stout, extending to beyond middle of the margin; first subcostal branch emitted at one-third before end of the cell, second branch at one-ninth before the end, third at fully one-third beyond the cell, fourth and fifth at two-thirds; upper discocellular short and outwardly-oblique, middle concave, lower rather slender and outwardly-oblique; middle median veinlet at considerable distance from lower end of cell, lower median at fully half from the end; submedian vein straight. *Hindwing* triangular; costa prominently arched at the shoulder, apex obtusely rounded; exterior margin oblique, slightly sinuous and with a projecting prominent angle at end of upper median, anal angle pointed; precostal vein bifid, radial emitted close to base of subcostal branch; cell open. *Body* stout; palpi ascending, projecting half beyond the front, clothed with rather closely-appressed long scales, second joint more hairy above; *forelegs in male*—femur scaly, tibia and tarsus laxly clothed with long fine silky-hairs which are longest on the tarsi; femur longer than tibia, the tibia and tarsus of equal length; *forelegs in female*—femur, tibia and tarsus very slender, scaly, very sparsely fringed on their outer side with a few very fine longish hairs; tibia and tarsus of equal length, tarsus four-jointed, second, third, and fourth joint armed beneath with a few minute spines and two stronger spines at the apex; antennæ with a short obtuse club; eyes hairy.

LARVA.—Body cylindrical; head flattened in front, vertex broad and sharply depressed in the middle, minutely hairy, cheeks slightly tuberculous; third to last segment armed with a dorsal and four lateral rows of rigid branched-spines on each side.

PUPA.—Suspended by tail. Thorax and abdomen laterally protuberant in front ; with an antero-dorsal and thoracic pointed prominence ; abdominal segments with a row of dorsal and lateral small points ; head-piece projected and widely cleft.

TYPE.—*S. Hippoclus*.

DISTRIBUTION OF GENUS.—This is a truly oriental genus, being found, in India throughout the Himalayas, Assam, and the Eastern Ghats ; in Burma, Upper Tenasserim, Malay Peninsula and Archipelago, extending to the Philippine Islands and W. and C. China, but does not occur in Ceylon, the Andaman or Nicobar Islands.

SEASONAL VARIATION.—The species of this genus, occurring within our area are, apparently, all seasonally variable, the markings of the upperside, in both sexes of the *wet-season* broad, being narrow and brightly-coloured, and in those of the *dry-season* brood broader, more irregularly-shaped, and paler in colour. In a Philippine species (*S. Anna*, Semper) the sexes are dimorphic—the male having red bands and the female ochreous-white bands,—and in *S. dissoluta*, Stgr., from Palawan, the bands in male are red, and in female almost white. In the Java species (*S. Javanus*)—figured in Hübner's Exot. Schmett.—the male has red bands, and the female is stated to be dimorphic, some having red bands, others pure white bands.

### SYMBRENTHIA LUCINA.

*Wet-season form* (Plate 321, fig. 1, larva and pupa ; fig. 1a b, c, ♂ ♀).

*Symbrenthia Khasiana*, Moore, Proc. Zool. Soc. 1874, p. 569, ♂ ♀. de Nicéville, Butt. of India, etc., ii. p. 241 (1886).

*Symbrenthia Hippoclus*, Moore, Proc. Zool. Soc. 1882, 243, pl. 11, fig. 4, 4a. de Nicéville, Journ. As. Soc. Bengal, 1882, p. 57. Butt. of India, etc., ii. p. 240 (1886). Doherty, *id.* 1886, p. 122.

Distant, Rhop. Malay. p. 431, pl. 42, fig. 4, 5, ♂ ♀ (1886). Leech, Butt. China, etc., i. p. 284.

*Symbrenthia Asthala*, Leech, *l.c.* pl. 25, fig. 2, ♂.

IMAGO.—Male. Upperside fulvescent-black, with pale fulvous bands. Cilia alternated with white. *Forewing* with an elongated rather narrow irregular clavi-form discoidal band, its upper edge indented before and at end of the cell, its lower edge including and slightly bordering the median vein ; a subapical oblique sinuous band extending to the costa, its lower portion being usually broken in two, but sometimes coalescent, above its end there is generally a very small attached spot and always a slender apical lunule ; below is an oblique discal band, which is constricted at the lower median veinlet, its upper portion being quadrate and sometimes with a very small attached spot at its outer lower angle. *Hindwing* with a short basal costal patch, a rather broad discal band, which is narrowest anteriorly and widens suddenly on the abdominal margin ; a much narrower submarginal

band gradually attenuating and ending at the upper subcostal veinlet, its inner edge sinuous and sometimes anteriorly dotted with black; followed by a marginal more or less interrupted fine line. Underside pale fulvous or yellowish-ochreous, marked with dark ferruginous short streaks and spots almost throughout, those across the disc of both wings assuming the form of a somewhat conspicuous darker band, which band, on the forewing, has a pale violet streak bordering its lower inner end. *Forewing* also with the outer-discal markings forming two submarginal continuous ill-defined sinuous lines, between which is a series of small indistinctly-defined ocellate spots, the one between the upper and middle median being the most distinct and with a violet-speckled centre. *Hindwing* also with the outer-discal markings forming two submarginal continuous ill-defined sinuous lines, between which is a row of very indistinctly-formed conical spots, those from the discoidal veinlet to the anal angle being broadest and with their shape obliterated by numerous bluish-violet speckles, some of these speckles being also scattered above the abdominal angle; outside these spots is a marginal lunular line, the lunule above the caudal angle being speckled with bluish-metallic scales. *Thorax* above olivescence-brown, abdomen black with a broad pale fulvous band; frontal tuft fulvous; palpi above blackish; body and palpi beneath, and legs, pale yellowish-ochreous; antennæ black, annulated with pale ochreous beneath, tip fulvous.

Female. Upperside with all the bands as in male, but slightly broader and paler. Underside with the ground-colour paler; all the markings as in male, but clearer and better defined. *Body* as in male.

Expanse, ♂  $1\frac{8}{10}$ , ♀  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 321, fig. 1, d, e, f, g, ♂ ♀).

*Papilio Lucina*, Cramer, Pap. Exot. iv. p. 82, pl. 330, fig. E, F, ♀ (1780).

*Symbrenthia Daruka*, Moore, Proc. Zool. Soc. 1874, p. 570, pl. 66, fig. 10, ♂.

Male. Upperside. Both wings with all the bands much broader and somewhat paler than in wet-season form. *Forewing* with the discoidal band coalescing at its upper and lower end with subapical and discal band, the two latter bands also partially coalesced, and the subapical band also with the apical streak; the lower outer angle of the discal band extending to the posterior angle. *Hindwing* with the discal and submarginal band coalesced on the abdominal border; some transverse short slender streaks also extending from the former to the latter between their upper end; marginal interrupted line distinct. Underside paler and with all the markings less defined than in wet-season form.

Female. Upperside with all the bands broad and coalescent, as in male, but with paler central areas. Underside with the ground-colour pale and the markings less defined, as in male.

Expanse, ♂  $1\frac{7}{10}$ , ♀ 2 to  $2\frac{2}{10}$  inches.

LARVA.—Body cylindrical. Head black, flattened in front, vertex broad and sharply depressed in the middle, minutely hairy, cheeks slightly tuberculous; third to the last segment armed with a dorsal and four lateral rows of black rigid branched-spines on each side; segments fuliginous-black; second segment with a slender pale ochreous dorsal line, third to last segment with two dorsal and two sublateral rows of small pale ochreous spots.

PUPA.—Suspended by tail. Pale purpurescent-ochreous; thorax and abdomen laterally protuberant in front; with a thoracic and anterior-dorsal pointed prominence; abdominal segment with a row of dorsal and lateral small points; head-piece projected and widely cleft. (Described from preserved specimens in Coll. Hocking.)

HABITAT.—W. and E. Himalayas; Assam; Khasias; Burma; Tenasserim; Malay Peninsula; S. China.

DISTRIBUTION.—We possess specimens of both the wet and dry season form from Kasauli, N.W. Himalayas, Nepal; Sikkim; Bhotan; Khasia Hills (Swinhoe); Karen Hills, Burma; and W. China. In the British Museum are examples from the Kali Valley, Kumaon; Landoor; Sikkim and Bhotan, taken in March and April by Mr. G. C. Dudgeon; Tilin Yaw, Burma, taken by Capt. E. Y. Watson in February; Karen Hills taken in December; Thoungyeen Valley, March (Capt. C. T. Bingham); Hong Kong (J. J. Walker, R.N.); Colonel C. Swinhoe has received numerous examples from the Khasia Hills. Mr. L. de Nicéville records it as "the widest spread species of the genus and the most abundant in individuals where met with. It occurs in India throughout the Himalayas and Assam to Upper Tenasserim" (*l.c.* 241). "Fairly common, in the W. Himalayas, in the beds of streams during the summer and autumn" (*id.* Ind. Agriculturist, 1880). The Rev. J. H. Hocking found the larva feeding on Nettle, in August, at 6200 feet elevation, in the Kangra Hills. Mr. P. W. Mackinnon says "it occurs somewhat commonly at Masuri and in the interior from April to October. The larva feeding on *Debregeasia bicolor*, N.O. Urticacæ, and is gregarious" (J. Bombay N. H. Soc. 1898, 376). Mr. W. Doherty says it is "found, commonly, in low country and river valleys in Kumaon, as far up as the Dhoaj, 6500 feet elevation. I have also taken it in the Eastern Ghats of the Indian Peninsula, in the districts of Ganjam and Vizagapatam" (J. A. S. Bengal, 1866, 122). It is "common in Sikkim, up to about 6000 feet elevation, all through the warm months. The larva feeding on *Girardinia heterophylla*" (L. de Nicéville, Sikkim Gaz. 1894, 145). Col. C. H. E. Adamson says it is "fairly common in Lower Burma, but is not common in Upper Burma, though on two successive days I took about a dozen at one spot near Sayaing, in January (List Burm. Butt. 1897, 25). Mr. W. L. Distant records it from "Perak, Malay Peninsula" (Rhop. Malay. 431).

Mr. J. H. Leech has several examples of both forms—which we have verified—from Omeishan, W. China, and from Ichang, C. China. Mr. J. J. Walker found it common in Hong Kong from December to May. Fresh specimens being on the wing in February (Tr. Ent. Soc. 1895, 458).

We have adopted Cramer's name *Lucina*, being the oldest, given by him to his figure of the Chinese female of the dry-season form of this species.

Of our illustrations on Plate 321, fig. 1 represents the larva and pupa from the Rev. J. H. Hocking's Kulu collection; figs. 1 a, b, c, male and female of the *wet-season* form (being the types of *Khasiana*), and figs. d, e, f, g, the male and female of the *dry-season* form (fig. e being the type of *Daruka*).

### SYMBRENTHIA COTANDA.

*Wet-season form* (Plate 322, fig. 1, 1a, b, ♂, 1c, d, ♀).

*Laogona Hypselis*, Doubleday and Hewits. Gen. D. Lep. i. p. 191, pl. 25, fig. 1, ♂ (1847)—*nec* Godart.

*Symbrenthia Hypselis*, de Nicéville, Butt. India, etc., ii. p. 341 (1886). Elwes, Trans. Ent. Soc. 1888, p. 364. Swinhoe, Trans. Ent. Soc. 1893, p. 288. Staudinger and Schätz, Exot. Schmett. ii. p. 123, pl. 16 (1887).

*Symbrenthia Sinis*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 357, pl. F, fig. 9, ♂.

IMAGO.—Upperside. Both wings dark fulvescent-black; cilia alternated with yellow. *Forewing* with a rich dark fulvous, rather narrow discoidal streak extending along lower half of the cell to beyond its end, its upper edge irregularly waved or slightly sinuous, the end truncate between base of upper and middle medians, its lower edge also waved or slightly extending sinuously below the median vein, the basal area of the wing being also tinged with fulvous; a subapical short oblique angular streak divided into two portions by the lower radial, and with a small spot sometimes present disposed inwardly above it; a lower-discal inwardly-oblique band from below middle median to the posterior margin. *Hindwing* with a rich dark fulvous inwardly-oblique narrow irregular-edged short medial-discal band with sometimes a small paler costal spot above it; beyond is a submarginal broader band attenuating anteriorly and ending at the lower subcostal, and an obsolescent fulvous slender marginal line sometimes present from the anal to near outer angle; abdominal margin broadly to the submedian fulvescent-yellow basally and greyish-brown posteriorly, with the blackish bars of the underside slightly visible; the hairy clothing of the lower-discal area from the base dark fulvous. Underside. Both wings pale olivescence-yellow, with a submarginal and marginal very slender black line. *Forewing* with the costal area and from below the cell obliquely across the disc to near middle of the outer margin tessellated with short black marks; the lower

area of the cell and posterior border being white, the lower cell area and median interspaces blotched with pale fulvous. *Hindwing* with the basal area and lower-discal area tessellated with black marks divided by a whitish transverse medial interspace representing the band of the upperside; beyond is a submarginal series of five metallic-green conical spots, each being thickly powdered with black scales and edged with black, the whole series encompassed by a fine black line, the veins between the spots being also black lined; bordering these spots is an inner black lunular line, and outwardly a marginal row of metallic-green black-speckled lunules, the three lowest lunules from the anal angle being broad, a similar lunule also present at the abdominal angle. *Body* above black; thorax thickly clothed with iridescent green and fulvous hairs, abdomen with fulvous segmental bands; head above black, front whitish; palpi above black, pale yellow beneath; body beneath and legs pale yellow; abdomen beneath with lateral black spots; antennæ black above, whitish beneath.

Female. Upperside duller fulvescent-black; all the bands yellowish-ochreous. *Forewing* with the discoidal band as in male; the subapical streak continued to the costa and having a minute spot also present outside its lower end, with which it is sometimes coalescent, a small apical streak also above it; outer band the same as in male. *Hindwing* with the discal band narrow as in male, the blackish tessellate marks of the underside being very slightly visible basally; outer-discal band narrower; marginal disconnected line slightly apparent. Underside as in the male.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 322, fig. 1, e, ♂, 1, f, g, h, ♀).

*Symbrenthia Cotanda*, Moore, Proc. Zool. Soc. 1874, p. 569, pl. 66, fig. 9, ♂. de Nicéville, Butt. India, ii. p. 242 (1886); *id.* Sikkim Gazetteer, 1894, p. 145.

MALE.—Upperside duller fulvescent-black than in *wet-season* form. Both wings with all the bands broader, more irregular in shape, and of a somewhat paler fulvous. *Forewing* with the broad discoidal band diffusedly extending brokenly below the cell towards the posterior margin and partly coalescing with inner end of the outer band, the subapical band composed of three conjoined portions. *Hindwing* with the discal band extending broadly to the costal edge, where it is pale yellow; the outer band broader and more irregularly-edged; the fulvous marginal disconnected line from anal angle distinct, its upper end joined to the discal band. Underside similar to *wet-season* form.

Female. Upperside. Ground-colour dark fulvescent-brown; the black tessellate markings of the underside being more or less partially visible; the bands yellowish-ochreous with paler central areas, broader and more irregularly-edged than

in female of wet-season form. *Forewing* with the discoidal band slightly confluent with lower end of subapical band; the apical streak longer and narrow; the lower band very broad, its upper irregular end sometimes almost touching the subapical band. *Hindwing* with the discal band very broad, its central area pale yellow; tessellate marks of underside slightly visible; outer band broad, its upper end extending inward and sometimes joined to the discal band; marginal line extending to apex. Underside paler throughout than in *wet-season* form.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$  inches.

HABITAT.—W. and E. Himalayas; Assam; Khasia and Naga Hills; Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—Mr. W. Doherty records it as being "common in the Kali Valley, 2000 to 4000 feet elevation in Eastern Kumaon" (J. A. S. Beng. 1886, 122). Mr. L. de Nicéville says it is "not nearly so common as *Hippoclus* [Lucina]. It has a habit of flying backwards and forwards in a narrow gorge between rocks in one of the mountain streams so common in the Himalayas, and occasionally settling on the overhanging foliage" (Indian Agriculturist, 1880). We possess the wet and dry-season forms from Nepal, Sikkim, and the Khasia Hills. Col. C. Swinhoe has both forms from the Khasias, and males of the wet form from Kaschmir. Mr. L. de Nicéville records it also from "Bhotan, Assam, Naga Hills, Cachar, Karen Hills, Burma, and Malay Peninsula" (J. Bombay N. H. S. 1891, 357). "It is the commonest species of the genus in Sikkim, and is found up to 4000 feet elevation almost throughout the year" (*id.* Sikk. Gaz. 1894, 145). Mr. H. Grose-Smith has it from the Ruby Mines, Burma. Specimens from the Thoungyeen Valley, Upper Tenasserim, taken in November and February, by Capt. C. T. Bingham, are in the British Museum.

#### SYMBRENTHIA BRABIRA.

*Wet-season form* (Plate 323, fig. 1, 1a, ♂, 1, b, c, ♀).

*Synbrenthia Asthala*, Moore, Proc. Zool. Soc. 1874, p. 269, pl. 43, fig. 9, ♂. Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 122. de Nicéville, Butt. of India, etc., ii. p. 244, pl. 23, fig. 106, ♂ (1886).

IMAGO.—Male. Upperside rich fulvescent-black; the bands of the same rich dark fulvous, as in male of *S. Cotanda*, and of the same shape but not so broad as in the dry-season form of the latter species. Underside nearly uniformly bright ochreous-yellow; tessellated marks smaller, narrower, and more widely apart than in wet-season form of *S. Hysudra*; the submarginal conical spots on the hindwing small, imperfectly formed and slightly speckled with metallic-green scales; marginal lunules continuous and metallic-green speckled.



Female. Upperside with slightly paler bands than in male. *Forewing* with the discoidal band somewhat narrower, the other bands slightly broader, the subapical band reaching the costa, and with two very small apical spots above its end. *Hindwing* with both bands somewhat narrower than in male. Underside as in the male.

Expanse, ♂  $1\frac{8}{10}$ , ♀ 2 inches.

*Dry-season form* (Plate 323, fig. 1, d, e, ♂).

*Symbrenthia Brabira*, Moore, Proc. Zool. Soc. 1872, p. 558. de Nicéville, Butt. of India, etc., ii. p. 244 (1886).

Male. Upperside duller fulvescent-black and the bands paler than in *wet-season* form. Both wings with very broad irregularly-edged bands, broader than in dry-season *S. Cotanda*; the discoidal band on forewing diffused hindward below base of the cell. Underside bright ochreous-yellow; tessellated marks somewhat narrower and less perfectly formed than in the *wet-season* form; the submarginal series of spots on hindwing not conically defined, each being formed by an upper and lower short lunate line, the centres being very sparsely metallic speckled.

Expanse, ♂  $1\frac{7}{10}$  inch.

HABITAT.—Western Himalayas.

DISTRIBUTION.—We possess the type specimen (*Asthala*), the *wet-season* form, taken in Kaschmir by Capt. R. Bayne Reed, and also that of the dry-season form (*Brabira*). Mr. P. W. Mackinnon says, it is “rather rare in Masuri, but flies from April to September. It occurs also in the Tehri Garhwal and the Upper Ganges Valley” (J. Bombay N. H. Soc. 1898, 376). Mr. W. Doherty (J. A. S. Bengal, 1886, 122) records it from the “Pindari Valley, N.W. Kumaon, at 7000 feet elevation.”

NOTE.—*Brabira* being the oldest name, takes precedence of that given to the *wet-season* form. We have not seen a female of the dry-season form.

### SYMBRENTHIA SIVOKANA.

*Wet-season form* (Plate 323, fig. 2, 2a, ♂; 2b, ♀).

IMAGO.—Male. Upperside rich dark fulvescent-black; the bands rich dark fulvous, similar to those in *wet-season S. Asthala*; the bands on forewing somewhat shorter. Underside light yellow with defined intervening patches of ochreous-yellow between the markings; both wings with all the markings very slender. *Hindwing* with the submarginal row of conical spots very small and having pale yellow centres, their inner-edge only being slightly speckled with bluish-grey scales; the lower

marginal lunules and the lunule at abdominal angle slender and bluish-grey speckled.

Female. Upperside with the bands as in male, of the same colour and width. *Forewing* also with a small spot above outer end of subapical band. Underside of the same pale yellow ground-colour and defined patches of bright ochreous-yellow as in male; the tessellate markings broader; the submarginal row of conical spots on hindwing with clear pale centres as in male; the marginal lunules also the same as in male.

Expanse, ♂  $1\frac{6}{10}$ , ♀  $2\frac{2}{10}$  inches.

HABITAT.—Sikkim.

DISTRIBUTION.—Under the name *S. Asthala* Mr. L. de Nicéville refers to this species as having "been brought in considerable numbers in April, May and October, from native Sikkim by native collectors. It is very plentiful at Sivoke in March" (Sikkim Gazetteer, 1894, 145). Specimens of both sexes from Sivoke, Sikkim, taken in March and May by Mr. G. C. Dudgeon, are in the British Museum. Other examples are in our own collection, and also in that of Mr. P. Crowley and Mr. H. Grose-Smith.

#### SYMBRENTHIA HYSUDRA.

*Symbrenthia Hysudra*, Moore, Proc. Zool. Soc. 1874, p. 268, pl. 43, fig. 8, ♀ (*dry-season*). Doherty Journ. Asiatic Soc. Bengal, 1886, p. 123. de Nicéville, Butt. of India, etc., ii. p. 244 (1886).

*Wet-season form* (Plate 324, fig. 1, 1a, ♂, 1, b, c, ♀).

IMAGO.—Male. Upperside fulvescent-black; the bands uniformly fulvous. *Forewing* with a broad very irregularly sinuously-edged discoidal band, a broad subapical oblique sinuous band extending to the costa, and a broad lower-discal band, the latter being sinuous on its inner edge, curved on its outer edge, and joined by a narrow upper streak to the lower end of subapical band, above which latter is a slender apical lunule. *Hindwing* with an irregular-edged broad discal band and a rather broad submarginal band, the latter attenuated and curved upward to the upper median; followed by a slender interrupted marginal line to the apex. Underside yellowish-ochreous, blotched with darker ochreous. *Forewing* with the costal and medial tessellate marks broadly black; marginal black line prominent. *Hindwing* with the basal and lower discal tessellate marks broadly black; the submarginal conical spots large and speckled with metallic greyish-blue scales; the marginal lower lunules and lunule at abdominal angle also metallic greyish-blue.

Female. Upperside with the bands paler than in male. *Forewing* with the discoidal band less irregular edged, the subapical band broader and disconnected

from the lower band. *Hindwing* with the bands as in male. Underside as in the male.

Expanse, ♂  $2\frac{2}{10}$ , ♂  $2\frac{3}{10}$  inches.

*Dry-season brood* (Plate 324, fig. 1, d, e, ♂, 1, f, g, ♀).

Male. Smaller than in wet-season form. Upperside with all the bands as in wet-season form, but somewhat paler. Underside paler yellowish-ochreous; tessellate marks the same but somewhat smaller; the submarginal series of spots smaller and not conical, each being formed by an upper and lower short black line, the lower second and third only being slightly speckled with metallic greyish-blue scales; marginal lower lunules and lunule at abdominal angle speckled with metallic greyish-blue scales.

Female. Upperside with slightly paler bands than in male; all the bands similar. *Forewing* with the subapical band broader, its lower inner angle touching the discoidal; lower-discal band partly joined by a streak to the lower ends of both the discoidal and subapical band. Underside as in the male.

Expanse, ♂  $1\frac{8}{10}$ , ♀ 2 inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—We possess the type specimen, a dry-season male, taken in Kaschmir by the late Capt. R. Bayne Reed. A female from Kulu is in Col. C. Swinhoe's collection, and a female, also from Kulu, in Mr. P. Crowley's collection. A male, taken at Kaleni, at 3900 feet elevation, in May, by Capt. McArthur, is in Mr. J. H. Leech's collection. Mr. W. Doherty obtained it in the "Pindari Valley, 5000 to 8000 feet elevation, N.W. Kumaon" (J. A. S. Bengal, 1886, 123).

### SYMBRENTHIA NIPHANDA.

*Wet-season form* (Plate 325, fig. 1, 1a, ♂, 1, b, c, ♀).

*Symbrenthia Niphanda*, Moore, Proc. Zool. Soc. 1872, p. 559. de Nicéville, Butt. of India, etc., ii. p. 243 (1886).

IMAGO.—Male. Upperside fulvescent-black; cilia alternated with white. *Forewing* with a yellowish-ochreous rather narrow band extending along lower half of the cell, including the median vein, and ending between the base of upper and middle median veinlets, its end being distinctly truncate, the upper edge irregularly waved, its lower edge even; a subapical outwardly-oblique narrow irregular band extending to the costa, a small apical lunule, and a lower-discal inwardly-oblique narrow somewhat recurved band. *Hindwing* with a broader discal band narrowing to the costa, below which is a submarginal somewhat lunular band attenuating

anteriorly to the upper subcostal veinlet, followed by a slender interrupted marginal line. Underside bright ochreous-yellow, with two marginal prominent slender black lines. *Forewing* also with broad black tessellated marks from base of costa to the apex and obliquely from below base of cell to middle of outer margin, the interspaces representing the areas of the bands of the upperside being glossy bluish-white and distinctly defined. *Hindwing* also with the basal and lower discal area tessellated with broad black marks, the intervening discal area being glossy opalescent-white; a submarginal series of five metallic-green conical spots, the two upper smallest and somewhat flattened, each spot black-speckled and outlined with black, and all encompassed by an outer slender black line; beyond is a marginal anterior black line, and posterior metallic-green lunules ending in a partially disconnected anal broader black lunule centred with blue-speckles; a small blue-speckled lunule also at abdominal angle; the linear interspace between the second row of basal black marks, and also between those above the abdominal angle being white. *Body* and palpi above fulvescent-black; abdomen with ochreous bands; body beneath and legs ochreous-yellow, abdomen with black spots; antennæ black, tip ochreous.

Female. Upperside with similar but slightly broader, and paler bands than in male. Underside as in male; all the markings somewhat broader, the marginal lower metallic-speckled lunules on the hindwing also much broader.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀  $2\frac{4}{10}$  inches.

*Dry-season form* (Plate 325, fig. 1d, e, ♂).

Male. Somewhat smaller than wet-season form. Upperside with all the bands similar, but of a paler yellowish-ochreous, their middle areas palest and their edges somewhat more irregular. Underside paler yellow than the wet-season form. Both wings with the tessellate black marks smaller, the white bands representing those of the upperside not glossy. *Hindwing* with the series of metallic-green spots smaller, shorter, and somewhat quadrate in shape, the disconnected anal lunule and the lunule at abdominal angle centred with blue speckles.

Female. Upperside with the bands slightly broader than in male. Underside as male.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 inches.

HABITAT.—Sikkim.

DISTRIBUTION.—“This is rare in Sikkim, occurring at low elevations from about 3000 to 5000 feet, from March to October” (H. J. Elwes, Tr. Ent. Soc. 1888, 365).

**SYMBRENTHIA SILANA.**

*Wet-season form* (Plate 325, fig. 2, 2a, ♂).

*Symbrenthia Silana*, de Nicéville, Journ. Asiatic Soc. Bengal, 1885, p. 117, pl. 2, fig. 9; Butt. of India, etc., ii. p. 243 (1886).

IMAGO.—Male. Upperside fulvescent-black. *Forewing* with a yellowish-ochreous discoidal band, which is palest in the middle, and somewhat irregularly-clavate in shape; a subapical rather broad angulated oblique band not quite reaching to the costa, and above which is a slender curved apical lunule; below is a broad lower-discal oblique band. *Hindwing* with a broad yellowish-ochreous discal band, palest in its middle, and not quite reaching the costa; a submarginal narrow band attenuating anteriorly and ending at the lower subcostal veinlet; a marginal obsolescent fine line. Underside bright ochreous-yellow. *Forewing* with very broad black tessellate marks, as normally disposed, except that the ordinary basal mark below the cell is absent, there being only three marks in the submedian interspace, and the two superposed subapical marks are distinctly ocellate, each having a white central dot; the marginal inner line is also thick, and the mark at posterior angle is large and prominent; the intervening areas representing the bands of the upperside are opalescent-white. *Hindwing* with broad black basal and lower-discal tessellate marks, the intervening discal area being opalescent-white, the outer-discal series of five spots are small, the middle one only being conical, the others almost round, and the three lower only are centred with metallic-blue scales; the three lower outer marginal connected-lunules are sharply angled and also centred with metallic-blue scales.

Female. "Larger. *Forewing* broader, the outer margin evenly curved; markings throughout paler; except the blue ones on the underside of hindwings, which are larger and more prominent. The subapical streak on the upperside of the forewing touching the costa, and a small narrow spot just within it."

Expanse, ♂ 2, ♀  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 325, fig. 2, b, ♂).

Male. Upperside with broader and paler bands, with more irregular edges. Underside paler yellow than in wet-season form, the areas representing the bands of upperside broader; markings the same, but not quite so broad; the submarginal black spot between the upper medians centred with blue speckles.

Expanse, ♂  $1\frac{8}{10}$  inch.

HABITAT.—Sikkim; Bhotan.

DISTRIBUTION.—"This is rare and local in Sikkim, at about 2000 feet elevation,  
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where Mr. Otto Möller has hitherto only procured it in May. It has also been taken at Buxa, Bhotan" (H. J. Elwes, Tr. Ent. Soc. 1888, 365). "All the specimens I have seen have been obtained in Sikkim at low elevations in March and May" (de Nicéville, *l.c.* 243).

MALAYAN SPECIES.—*Symbrenthia Hippoclus* (Pap. *Hippoclus*, Cramer, Pap. Exot. iii. p. 46, pl. 220, fig. C, D, ♂ (1779). Staudinger, Exot. Schmett. pl. 36, ♂. *Habitat.* Amboina.—*Symbrenthia Javanus* (Sym. *Hippoclus*, var. *Javanus*, Staudinger (Fruhstorfer, Berl. Ent. Zeit. 1896, p. 314); Sym. *Hippoclus*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, pl. F, fig. 10, *dimorphic* ♀. *Hypanartia Hippocla*, Hübner, Samml. Exot. Schmett. iii. fig. 1, 2, 3, 4, ♂, *dimorphic* ♀ (1827). *Habitat.* Java.—*Symbrenthia Violetta*, Hagen, Deuts. Ent. Zeit. Lep. 1896, p. 165. *Habitat.* Sumatra; Borneo.—*Symbrenthia Niasica*. Male. Differs from *Violetta* on the underside in the ground-colour being duller ochreous-yellow and all the red markings very inconspicuous. On the *forewing* the small round spot between the upper and middle median is centred with ochreous-yellow and has a distinct blackish outer attached mark, the lower-discal oblique fascia is also inwardly-edged with yellow, in the Sumatran *Violetta* both these parts are distinctly violet. On the *hindwing* the obsolescent conical spots are also entirely yellow, and are not speckled with violet scales, the marginal lunular line is distinctly inwardly-bordered with blackish lunules from the anal angle to the apex, the lunule above outer angle being blue speckled. Female. Upperside with the bands similar but narrower than in *Violetta*. Underside paler than in male, the ground-colour and markings similar to *Violetta*, except that on the hindwing the marginal lunular line has a more or less defined inwardly-bordered shade. *Habitat.* Nias (Coll. Swinhoe and British Museum).—*Symbrenthia Semperi* (Sym. *Lucina*, Semper, Reisen Phil. Lep. p. 114, pl. 21, fig. 7, 8, ♂ ♀. *Habitat.* Philippines.—*Symbrenthia Anna*, Semper, *l.c.* p. 114, pl. 21, fig. 5, 6, ♂ ♀ (1888). *Habitat.* Bohol, Philippines.—*Symbrenthia Hypatia* (Laogona *Hypatia*, Wallace, Trans. Ent. Soc. 1869, p. 345, ♂). Hagen, Deuts. Ent. Zeit. 1896, p. 165. Distant, Rhop. Malay. p. 432, pl. 42, fig. 6, ♂. Fruhstorfer, Stett. Ent. Zeit. 1894, p. 125, pl. 3, fig. 4, ♂. de Nicéville, J. As. Soc. Bengal, 1895, p. 428. *Syn.* Symb. Chersonesia, Fruhst. Berl. Ent. Zeit. 1893, p. 38. Symb. Hippocrene, Staudinger, D. Ent. Zeit. 1896, p. 232, pl. 5, fig. 3, ♂. We have compared Wallace's type specimen, now in the Oxford University Museum, with male Sumatran and Bornean examples. A Sumatran female, in Mr. Godman's collection, has all the bands on the upperside broader and paler fulvous than in male; the ground-colour on the underside is slightly paler, but with all the dark reticulated markings the same as in male, except that on the forewing the two transverse discal slender lines between the lower median and submedian are joined together longitudinally in their middle and form a distinct yellow letter X. *Habitat.*

Java; Sumatra; Borneo; Malay Peninsula.—*Symbrenthia dissoluta*, Staudinger, Iris, 1889, p. 49. *Habitat.* Palawan.—*Symbrenthia Ottilia*, Fruhst. Berl. Ent. Zeit. 1897, p. 327. *Syn. Sym.* Hypselis, Weymer, Stett. Ent. Zeit. 1885, p. 264. *Habitat.* Nias, ? Sumatra.—*Symbrenthia Hypselis* (Vanessa Hypselis, Godart, Enc. Méth. ix. Suppl. p. 818 (1823). Laog. Hypselis, Boisd. Spéc. Gén. Lep. i. pl. x. fig. 3, ♂ (1836). *Sym.* Hypselis, de Nicéville, Journ. Bombay N. H. S. 1891, p. 356, pl. F, fig. 8, ♂. *Habitat.* Java.—*Symbrenthia Sinica*. Male. Upperside with the fulvous bands similar to those in Sikkim wet-season form of *Cotanda*, except that on the forewing the subapical band is longer, narrower, and its lower part longer. Underside with broader and more compactly-disposed black tessellate markings than in *Cotanda*, the metallic-blue conical spots on hindwing only about half their size, and the three marginal lower blue lunules very narrow. Female. Upperside with somewhat paler bands than in male, all wider. Underside as in the male. Expanse, ♂ 2, ♀ 2 $\frac{4}{10}$  inches. *Habitat.* W. China (Coll. Leech).

### Genus PROTHOË.

*Prothoë*, Hübner, Samml. Exot. Schmett. ii. fig. 54 (1823-26). Doubleday and Westwood, Gen. D. Lep. ii. p. 266 (1850). Wallace, Trans. Ent. Soc. 1869, p. 80. Distant, Rhop. Malay. p. 110 (1883). Semper, Reisen Phil. Lep. p. 77 (1886). de Nicéville, Butt. of India, etc., ii. p. 293 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 177 (1888).

IMAGO.—Male. Wings large. *Forewing* triangular; costa slightly arched, apex obtuse; exterior margin slightly oblique, nearly straight and also even, posterior angle rounded; posterior margin almost straight; costal vein strong, extending to half the margin; cell extending to two-fifths at its upper end from the base; first subcostal branch emitted at one-fourth before end of cell and curved upward towards end of the costal vein, but entirely free from it; second subcostal branch at half-way between it and end of cell; third subcostal at one-sixth beyond the cell and extending to the apex; fourth and fifth branch at two-sixths beyond the cell, the fourth branch deflexed before reaching the end below the apex; upper discocellular extremely short, almost obsolete; middle discocellular oblique, rather short and slightly convex; the lower discocellular long, its upper end deeply concave, the lower end extending obliquely outward; middle median veinlet at one-sixth before lower end of cell, lower median at one-half before the end; submedian vein nearly straight. *Hindwing* somewhat triangularly oval; anterior margin long, gently curved from near the base, apex oblique; exterior margin convexly-oblique from end of upper subcostal, slightly waved, produced between the upper and middle median into a short broad outwardly-curved tail, from thence to anal angle broadly scalloped; a prominent tuft of long fine silky hairs extending hindward from basal interspace between the submedian

and inner vein, the tuft *overlapping a glandular patch of scales*; precostal vein slightly curved; subcostal ending below the apex, radial emitted from subcostal branch at some distance from the latter; cell open; lower median emitted opposite base of discocellular, upper and middle medians at some considerable distance beyond; submedian and inner vein much recurved from the base. *Body* moderately stout; palpi rather short, projected forward to level of vertex, compressed laterally, clothed with short appressed hair-scales, end of second joint above more hairy, apical joint conical; forelegs of male very short, thickly clothed to the tip with short hairs; forelegs of female laxly scaly, tarsus dilated towards the extremity and slightly truncate at tip, the spines slender and sharp-pointed; antennæ slender, with an elongated slender gradually-formed club; eyes naked.

TYPE.—P. Franckii.

**PROTHOË ANGELICA** (Plate 326, fig. 1, 1a, b, c, ♂ ♀).

*Prothoë Angelica*, Butler, Annals of Nat. Hist. 1885, pp. 53, 54. de Nicéville, Butt. of India, etc., ii. p. 295, front plate, fig. 120, ♂ (1886).

*Prothoë uniformis*, Butler, l.c. pp. 53, 54 (1885).

*Prothoë Franckii* (part), Wallace, Trans. Ent. Soc. 1869, p. 80. Moore, P. Z. S. 1878, p. 832. Elwes, P. Z. S. 1891, p. 284.

IMAGO.—Male. Upperside. Both wings dark blue-black, the basal area palest and thickly irrorated with light blue scales. *Forewing* with a narrow black slightly angulated streak crossing end of the cell but not quite touching the median vein; a broad discal outwardly-oblique pale blue band (of a lilacine or cobalt tint in certain lights) extending from the costa to the posterior angle, and traversed through its middle area by two more or less indistinctly-defined white costal streaks and a row of five lower obliquely-dentiform decreasing irrorated white streaks, one in each interspace from lower subcostal to lower median, the blue band being variable in width, in the male from four-tenths to five-tenths of an inch, and it generally includes the black cell-streak; the inner edge of the band is, generally, regular and speckled, its outer edge being more defined and irregular; beyond is an apical series of five superposed rounded lilacine-white spots, of which the lower first and third are very small and generally indistinct or obsolete. *Hindwing* with two elongated lilacine-white spots at the extreme apical margin divided by the upper submarginal veinlet; a slender lilacine-white interrupted wavy marginal line extending from anal angle to near the outer caudal angle; the glandular tuft of hairs reddish-ochreous. Underside pale olivescient-buff or brownish-ochreous, with dark brown markings. *Forewing* with a broad dark brown posterior marginal area, a narrow outer marginal middle line, a looped-spot at base of the cell, two superposed annular spots in the middle and a W-shaped mark near its end continued to the costa, the discocellulars



enclosed by a double line, some bordering spots outside the cell, a large broad upper discal patch decreasing from the costa sinuously to near the upper median and traversed by a pale sinuous streak, two outer-discal large somewhat hastate marks between the radial and middle median, the lower one being generally broken, an upper submarginal series of small slender sinuous marks, the upper two being double and with white centre, the two lower with a white outer streak, a small similar sinuous mark also between the middle and lower median; the outer margin inwardly blotched with reddish-ochreous; obliquely across the disc the interspaces between the veins are somewhat whitish, indicating the white marks of the band on the upperside. *Hindwing* with a dark brown spot at the base of costal lobe, a streak from base of abdominal margin extending across base of cell to the costa, some streaks below the cell to abdominal margin a reniform mark in middle of the cell, another at its end extending to the upper subcostal veinlet, and a slender angled-streak beyond the cell, a small patch above the cell, some streaks below the cell, two broad partly-coalescent irregular upper-discal patches descending from the costa, followed by an outer-discal series of large conical-shaped spots—one between each of the interspaces—and each thickly irrorated with black and metallic-greyish-green scales, the anterior inwardly margined by a black and an ochreous-red outer line, the lower with a black line only, each also is outwardly bordered by a blackish line; the middle of outer margin including the upper half of the tail is dark brown, the lower half of the tail being green or greyish-green inwardly and whitish outwardly; anal lobe with a black angled-mark centred with red outwardly and bordered by green or greyish-green inwardly; a smaller similar streak also above anal angle.

**Female.** Upperside as in male, except that the blue band on the forewing is somewhat broader and its white markings also broader and longer. On the hindwing the apical white spots are also somewhat broader, and the lower marginal white line more prominent. Underside also as in male, except that on the forewing the interspaces between the veins obliquely across the disc—indicating the white portions of the band of the upperside—are broader and more defined. *Body* above blue-black, beneath whitish with blackish stripes; palpi above brown, sides white and with a black stripe beneath; legs blackish above, whitish beneath; antennæ reddish-ochreous.

Expanse, ♂ 3 to 3 $\frac{2}{10}$ , ♀ 3 to 3 $\frac{6}{10}$  inches.

**HABITAT.**—Upper Tenasserim; Malay Peninsula; Sumatra; Borneo.

**DISTRIBUTION AND HABITS.**—The type specimens are recorded by Mr. Butler from “Tenasserim, Borneo, and Sumatra” (*l.c.* p. 54). Mr. Otto Limborg took it at “Meetan, Upper Tenasserim, in April” (P. Z. S. 1878, 832). In Mr. F. D. Godman’s collection are specimens from Malawoon, Burma, taken by Mr. A. O. Hume, both sexes from E. Pegu, taken in March and September by Mr. W. Doherty;

also from Borneo. It is recorded from "Sandakan, N. Borneo" (Pryer and Cator, N. Borneo Herald, 1894, 258). Mr. H. Grose-Smith has a female from Daat Island, Labuan, and Mr. P. Crowley has both sexes from Perak, and Lawas, N. Borneo. Mr. W. Doherty records it as "occurring not uncommonly at the foot of the Karen Hills, E. Pegu, and was taken on the body of a dead Python. It is very fragrant in both sexes" (P. Z. S. 1891, 256). Mr. T. A. Hauxwell obtained it at Tounghou, Upper Tenasserim, and notes that it "flies low, and settles low down on the trunks of trees, with closed wings, only two or three feet from the ground. Once frightened it never returns to the same spot" (L. de Nicéville, J. Bombay N. H. 1899). It is "found not rarely in Sumatra. It settles on tree trunks with its head downwards" (*id.* J. A. S. Bengal, 1895, 439).

Our illustrations on Plate 326 are from a male and female taken in E. Pegu.

**PROTHOË REGALIS** (Plate 326, fig. 2, 2a, ♂).

*Prothoë regalis*, Butler, Annals of Nat. Hist. 1885, pp. 53, 54, 306, pl. 8, fig. 1, ♂. de Nicéville, Butt. of India, etc., ii. p. 296 (1886). Doherty, Journ. Asiat. Soc. Bengal, 1889, p. 126.

IMAGO.—Male. Upperside. "Both wings with the basal third and body olive-green. *Forewing* crossed obliquely from middle of the costa to the third-fourth of the inner margin by a broad silvery-blue belt, the external edge of which is irregularly notched and only separated by a blackish submarginal streak from three large spots of the same colour upon the centre of the external border; veins slenderly black, terminating in blackish spots, two of which are placed between the above-mentioned blue spots; two white spots followed by a blackish streak upon the costal part of the blue belt; a large triangular black spot closing the cell; apical area chocolate-brown; three subapical spots, the two upper large, placed obliquely, bluish, with white centres, the submarginal bluish, small. *Hindwing* with the centre of the wing blue-black; apical area and external border chocolate-brown; two linear apical blue dashes and a blue line along base of the fringe. Underside, *Forewing* whitey-brown, slightly tinted with greenish towards the base and with lilacine along the external border; markings very similar to those in *P. Franckii*, but the outline spots on the discoidal area filled in with dark olivaceous, with no trace of an oblique white band and with all the internervular submarginal markings cruciform. *Hindwing* with the basal half as in *P. Franckii*, excepting that the discoidal spots are filled in with dark olivaceous; external half considerably darker, its inner half greyish-olivaceous, enclosing a series of oblong internervular black patches, which are sinuated in front and bounded by reddish crescentic borders; immediately beyond these reddish crescents is a submarginal series of eight unequal

black-edged bronze-green spots, with brighter green borders; these spots are irrorated and more or less suffused with blackish; from apex to second median branch is a series of gradually increasing marginal black spots, edged externally with pink, the last two crossed by a red stripe; a large bright olive-green semi-circular spot, with black inner border and bluish-white outer border at outer extremity of first median interspace, and a large black spot, crossed by a red  $\Lambda$ -shaped marking, and bordered along its infero-exterior border with grey, at the extremity of interno-median area; a triangular black and red spot at extremity of abdominal fold" (Butler, *l.c.* 306).

Expanse, ♂  $3\frac{2}{10}$  inches.

HABITAT.—Manipur; Upper Assam.

NOTE.—"Duller in colour than *P. Angelica*; differs in the absence of white on the blue belt, and in the great width of the belt, and in the presence of blue marginal spots on the forewing, the less caudate hindwing, the cruciform character of the black submarginal markings of the underside of the forewing, the filled-in discoidal markings on both wings, the inner-half of external area of hindwing, on the underside, being greyish-olivaceous crossed by oblong black patches with reddish external borders, the shorter green and black submarginal arched spots, etc." (Butler, *l.c.* 54).

DISTRIBUTION.—A single specimen of the male of this species was taken in Manipur by Dr. G. Watt. Mr. W. Doherty "obtained one male near Margherita, and one was seen near Sadiya, Upper Assam, the former agreeing with *regalis* in the dusky underside, and the very broad blue band and five blue spots of the forewing above, but the hindwing and the base of the forewing have an obvious violet-gloss, though they are not, as in *angelica*, powdered with the bluish-white scales" (*l.c.* 126).

INDO-MALAYAN SPECIES.—*Prothoë Niasica*, Röber, Entom. Nachr. 1894, p. 366. *Habitat.* Nias Island.—*Prothoë Franckii* (Nym. Francki, Godart, Enc. Meth. ix. Suppl. p. 825 (1823). Hübner, Samml. Exot. Schmett. ii. pl. 54 (1823–26). Doubleday and Westwood, Gen. D. Lep. ii. p. 266, pl. 51, fig. 3, ♀ (1850). Wallace, Tr. Ent. Soc. 1869, p. 80. Butler, Ann. Nat. Hist. 1885, p. 52. *Habitat.* Java.—*Prothoë Semperi*, Honrath, Berl. Ent. Zeit. 1884, p. 204, pl. 2, fig. 1, 1a. Semper, Reisen Phil. Lep. p. 77, pl. 15, fig. 1 (1887). *Habitat.* Mindanao.—*Prothoë Plateni*, Staudinger (Semper, Reisen Phil. Lep. p. 334). *Habitat.* Mindoro.

### Genus AGATASA.

Male. More robust than in typical *Prothoë*. Forewing with the base of costal and subcostal vein curved inward, the subcostal being perfectly free from end of

costal vein; middle discocellular slightly concave, lower discocellular oblique and very slightly but evenly concave; basal interspace between the submedian and posterior margin thickly clothed with fine longish appressed woolly-hairs. *Hindwing* somewhat narrower than in *Prothoë*, the anterior margin very much arched from the base and thence oblique to apex; upper area of the cell longer, the radial starting from second subcostal at nearly equal distance as the latter does from the costal; submedian vein densely covered from its base to end with fine long laterally-spreading woolly-hairs; the basal area of the cell and of middle and lower medians also clothed with fine longish woolly-hairs. *Body* very robust; base of abdomen densely woolly; palpi longer, and curved upward.

TYPE.—*A. Calydonia*.

HABITS.—Mr. L. de Nicéville records *A. Calydonia* as being found, in Sumatra, only in forest, and is rare. Dr. L. Martin took his first specimen on a wounded tree, where it was sucking up the juice. It was on the fourth day, after having missed it the three previous days, and on the very same tree. Only one pair of this strong-winged butterfly may be found over a large area of forest, which likes to keep to the higher trees, quite out of the reach of the net, but is fond of fæces and strong-smelling things, such as carrion, to which it is often attracted and caught. It settles with the head downwards on tree trunks, and makes, while feeding, the same rotating movements in the hindwings as is done by many *Lycænidae*" (J. As. Soc. Beng. 1895, 438).

**AGATASA BELISAMA** (Plate 327, fig. 1, 1a, ♂).

*Prothoë Belisama*, Crowley, Trans. Ent. Soc. Lond. 1891, p. 403, pl. 18, fig. 1, 2, ♂.

Male. Upperside. *Forewing* with the medial, basal, and lower-discal area deep sulphur-yellow, the lower base bluish-white, the apical half from base of the costa across upper end of cell and then irregularly-angled across the disc to posterior margin before the outer angle, brownish-black; a small yellow narrow costal spot above end of the cell, an outwardly-oblique subapical series of four irregular-shaped spots, the first from the costa small, the next also small and placed between the lower subcostals, the third and fourth in the next interspaces, both being elongated; at the apex is a small obsolescent brownish-white spot. *Hindwing* with the base and lower-discal area bluish-white, the broad woolly covering of the submedian being slightly tinged with sulphur-yellow, the upper medial-discal interspaces between the subcostal and radial being also tinged with very pale sulphur-green, and the outer costal border above white; outer margin with a broad irregular bluish-black band, the extreme marginal edge having a slender interrupted white line. Underside. *Forewing*. Ground-colour white, with the medial-discal area from the

cell to outer margin bright yellow, the apical area clouded with very pale ochreous-brown; marked with three black spots along base of the costa, a spot at base of cell, two rounded spots across its middle, an elongated constricted spot beyond from the costa, and a streak close to end of cell; beyond is an irregular streak decreasing from the costa to the upper median veinlet, followed by some upper-discal irregular-shaped streaks and a lower loop-mark between the upper medians, and then by three outer transverse series of various narrow-shaped marks, the lowest of each series being disposed between the upper medians, the extreme outer-margin bordered by a slender black band, and above the posterior angle is an irregular, broken, diffused black patch; the intervening spaces between the cell markings and partly between those of the upper disc and of the outer margin, being bright ochreous-red. *Hind-wing*. Ground-colour white. Basal interspaces to the middle of the costa with partly confluent black streaks intervened with ochreous-red; a series of elongated black streaks disposed across the disc from middle of abdominal margin to near the anterior margin before the apex, the streaks being placed singly between the veins, except in the discoidal interspace, where it is in three portions, the intervening veins and their borders being lined with ochreous-brown, brightest between the discoidal portions and at outer end of the upper streaks; beyond are two pairs of submarginal prominent black lunular lines, each pair being traversed by a similar bluish-white line, the inner pair being also somewhat sinuous at the anterior end, and the interspace between the pairs is irrorated with pale green and black scales; outside the end of the outer pair is a row of three similar black-and-white lunules extending from anal angle to the caudal angle, the caudal portion being broadly black, each of these and those above the tail are outwardly bordered by bright yellow, and the outer black lunule at anal angle is broken by a small bright ochreous-red bar; intervening between the discal black streaks and the inner submarginal line is a parallel row of diffused black lunules. *Body* above white; base of thorax and of abdomen very woolly; collar with two black bands; head black and white spotted; palpi above and beneath black, its sides white; legs whitish above, blackish beneath; antennæ blackish above, red beneath.

Expanse, ♂  $4\frac{2}{10}$  inches.

HABITAT.—Lower Burma.

DISTRIBUTION AND HABITS.—The type specimen was taken in Tounghoo, and is in the collection of Mr. P. Crowley. Mr. W. Doherty obtained "three specimens at Petichaung, at the foot of the Karen Hills, E. Pegu" (P. Z. S. 1891, 284). Mr. T. A. Hauxwell states that "it occurs rarely in the Ataran Valley in March, and in the Tounghoo Hills, 3000 feet elevation, in April and June." As stated by Mr. A. R. Wallace, in "the Malay Archipelago, with regard to the very closely-allied *Prothoe Calydonia*, this species flies high and settles high up on tree trunks with closed

wings, very rarely descending to the ground. It invariably returns to the same spot when frightened off, so if its resting-place is within reach, the butterfly, with patience, can be secured with certainty. To capture one specimen my men and I had to construct three high platforms of bamboo adjoining three trees between which *P. Belisama* continually flew backwards and forwards. After some time we managed to secure the specimen " (L. de Nicéville, Journ. Bombay N. H. Soc. 1899).

INDO-MALAYAN SPECIES.—*Agatasa Calydonia* (Nymph. Calydonia, Hewitson, Exot. Butt. i. p. 86, pl. 43, fig. 3, 4 (1855). *Charaxes Calydonia*, Butler, P. Z. S. 1865, p. 638. *Prothoë Caledonia*, Butler, P. Z. S. 1867, p. 873. Distant, Rhop. Malay. p. 110, pl. 13, fig. 9, ♂ (1883). de Nicéville, Butt. India, etc., ii. p. 297 (1886); *id.* Journ. As. Soc. Beng. 1895, p. 438. *Habitat.* Malay Peninsula; Sumatra; Labuan, Borneo.—*Agatasa Chrysodonia* (*Prothoë Chrysodonia*, Staudinger, Deuts. Ent. Zeit. 1890-91, p. 86, pl. 4, fig. 6). *Habitat.* S.E. Mindanao.—*Agatasa Heterodonia*, Staudinger (Semper, Reisen Phil. Lep. p. 334). *Habitat.* Mindoro.

#### Genus RHINOPALPA.

*Rhinopalpa*, Felder, Wien. Ent. Monats. iv. p. 399 (1860); *id.* Neues Lep. p. 49 (1861). Distant, Rhop. Malay. p. 97 (1883). de Nicéville, Butt. of India, etc., ii. p. 245 (1886). Staudinger and Schätz, Exot. Schmett. p. 128 (1887).  
*Eurhinia*, Felder, Reise Novara, Lep. iii. p. 405 (1867).

IMAGO.—Male. Wings short, broad. *Forewing* triangular; costa very much arched, slightly indented near the base, apex truncate and obliquely-angulated outward to below the upper radial, deeply concave below it, sinuous, and broadly angled outward at the lower median veinlet, posterior angle rounded, posterior margin much recurved; costal vein extending to middle of the margin; first and second subcostal branches emitted near together before end of the cell, third branch at three-fifths beyond the cell, fourth and fifth at one-fifth from the apex; upper discocellular short and outwardly-oblique, middle discocellular practically obsolete, as the lower radial starts from the same point, lower discocellular absent and the cell entirely open; two upper median branches from opposite the discocellular; submedian vein straight. *Hindwing* somewhat quadrate; anterior margin lobate at the base, and thence oblique to the apex, exterior margin sinuous, almost erect from the apex to end of radial, where it is prolonged into a blunt tail and from thence concave to anal angle, which latter is broadly produced, the abdominal margin being excavated above the anal angle and more deeply so between the submedian and internal vein; precostal vein strongly bent outwards; costal vein strongly arched from the base, running close to the margin and ending at the apex; radial from close to base of lower subcostal; cell open. *Body*

stout, abdomen short; palpi long, porrect, compactly clothed beneath and at the sides, apical joint pointed; forelegs of male clothed with rather short hairy-scales, femur with long hairs beneath; fore tarsi of female smoothly scaled, tip dilated beneath, joints crowded together at the tip, spines acute; antennæ with a lengthened well-formed club; eyes naked.

TYPE.—R. Fulva.

**RHINOPALPA POLYNICE** (Plate 327, fig. 2, 2a, b, ♂ ♀).

*Papilio Polynice*, Cramer, Pap. Exot. iii. pl. 195, fig. D, E, ♂ (1780).

*Rhinopalpa Polynice*, Kirby, Catal. D. Lep. p. 191 (1871). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 429.

*Rhinopalpa fulva*, Felder, Wien. Ent. Monats. iv. p. 399 (1860). Butler, Trans. Linn. Soc. Zool. 1877, p. 545. Distant, Rhop. Malay. p. 98, pl. 12, fig. 1, ♂, 2, ♀ (1883). de Nicéville, Butt. of India, etc., ii. p. 246, pl. 23, fig. 102, ♂ (1886); Journ. As. Soc. Bengal, 1895, p. 429.

*Rhinopalpa Birmana*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 331.

IMAGO.—Male. Upperside reddish-ochreous; cilia black, alternated with white. Forewing with a dark ochreous-brown, almost black, outer marginal band, which is broadest anteriorly and of slightly variable width, its inner edge being curved to the costa. Hindwing with a similar coloured outer marginal band, which is broadest anteriorly, narrowing to above the radial veinlet and traversed outwardly by two indistinct paler lunular lines, from whence it is continued to the anal angle as two, more or less slender, or partly conjoined lunular black lines, the outer line being generally the broadest, the anal end dilated and angled upward and speckled with violet scales; within the lower submarginal area is a parallel series of four round black-speckled, or entirely black, spots, the upper one being between the radial and subcostal and sometimes encompassed by the marginal band. Underside clear sepia-brown, or dark sepia-brown, crossed by a subbasal and an ante-medial darker brown or purpureous-brown broad sinuous fascia, each edged on both the sides by a very slender violet-blue line, followed by two medial-discal slender dark brown sinuous fasciæ inwardly-edged by a slender violet-blue line; an outer-discal broad dark brown lunular fascia which is more or less slightly, or sometimes obsolescently, inwardly-bordered by reddish-ochreous lunules on both wings and less so outwardly on the forewing, but also more prominently outwardly on the hindwing, where, in the latter wing, the red lunules are sometimes broader and at anal angle dilated, the lower second and third lunules being sometimes absent; beyond them is a submarginal contiguous row of large rounded ocelli, each with a violet-blue and black central dot and black-and-violet edged outer ring; on the forewing there are six of these ocelli, the lowest being bipupilled and inwardly-bordered by a broad violet-

white straight streak, and above the upper ocellus is an apical sinuous white spot; on the hindwing there are only five ocelli, the apical being absent; beyond these ocelli are two outer submarginal slender violet-blue lines followed by a dark brown broader line; anal and caudal angle reddish-ochreous. Body reddish-ochreous; thorax olivescens-ochreous; palpi above brownish-ochreous, beneath white; legs dark brown; middle tarsi whitish above; antennæ blackish, reddish beneath, tip black.

Female. Upperside much paler ochreous, the base darker. *Forewing* with the blackish outer-marginal band broken towards posterior angle and slightly showing a bipupilled ocellus. *Hindwing* with the outer band not reaching the margin; lower submarginal spots smaller and with a slightly-indicated outer ring. Underside pale ochreous; the transverse sinuous fasciæ darker ochreous and with prominent violet-white edged-lines; outer series of ocelli prominent; marginal violet-white lines distinct.

Expanse, ♂  $2\frac{8}{10}$  to 3, ♀ 3 to  $3\frac{2}{10}$  inches.

HABITAT.—Assam; Cachar; Khasia Hills; Naga Hills; Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—“Mr. J. Wood-Mason obtained it in the forests near Silcuri, Cachar, from May to August. There are specimens from Cherrapunji, Assam, and the Naga Hills, in the Calcutta Museum. Mr. J. L. Sherwill took it in the Jorehat district, Assam, in October, Mr. H. M. Parish obtained a female in November in the Chittagong Hill Tracts. Capt. C. T. Bingham took a male in the Donat Range, Upper Tenasserim, in December, which approaches the figure of Cramer's *Polynice*, in having the ground-colour of the upperside much darker than the other specimens I have seen, and the outer black border broad at the apex of the forewing, the underside is also much darker. A female, taken in October also in the Donat Range, is also much darker than the Chittagong female mentioned above. It does not appear to be a common species anywhere” (de Nicéville, *l.c.* 247). Col. C. Swinhoe has received it from the Khasia Hills. Mr. P. Crowley has specimens from the Naga Hills, Tounghoo, Upper Tenasserim. Col. C. H. E. Adamson says “it appears to be scarce in Burma; I took four males at Phapoon on the Yunzaleen River in November, and have it also from Tavoy” (List 1897, 25). Dr. J. Anderson took it at “Minthantoung and in Mergui in December” (J. Linn. Soc. Zool. 1886, 35). We have verified males from Malacca and Perak, and a Malacca female in the Hewitsonian collection. Mr. de Nicéville says, “in N.E. Sumatra it is found only in large forest, the males being fond of fæces on forest roads; the females being very rare and are seldom seen in collections, perhaps escaping capture by the coloration being very different from that of the males, as on the wing the female closely resembles a common *Cirrochroa*” (J. A. S. Beng. 1895, 429). It also occurs in Borneo.



INDO-MALAYAN SPECIES.—*Rhinopalpa Eudoxia* (Vanessa Eudoxia, Guérin, Rev. Zool. 1840, p. 44; Delessert's Voy. l'Inde, p. 73, pl. 20, ♀ (1843). Distant, Rhop. Malay. p. 99, pl. 17, fig. 6, ♀ (1883). de Nicéville, Butt. India, etc., ii. p. 248. *Syn.* *Rhinopalpa Callonice*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 330, ♂ ♀. *Habitat.* Nias Island.—*Rhinopalpa Elpinice* (Eurhinia Elpinice, Felder, Reise Nov. Lep. iii. p. 405 (1867). *Habitat.* Java.—*Rhinopalpa Stratonice* (Eur. Stratonice, Felder, Reise Nov. Lep. iii. p. 607 (1867). Semper, Reis. Phil. Lep. p. 121, pl. 20, fig. 10, ♂, pl. 21, fig. 9, 10, ♀. *Habitat.* Philippines.

### Genus YOMA.

*Yoma*, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 258. de Nicéville, Butt. of India, etc., ii. p. 245 (1886).

IMAGO.—Male. Wings similar in shape to *Rhinopalpa*, except that in the forewing the outer margin is less sinuous below the subapical angle, and is less produced at the lower median; third subcostal branch emitted at more than one-third beyond the cell, fourth and fifth branch half-way thence to the end; upper discocellular distinct, short, middle discocellular long, angled obliquely-inward, and bent outward near lower end, lower discocellular slender and slightly concave; two upper median branches from lower end of the cell. *Hindwing* with the outer margin almost even and convex anteriorly, the caudal angle shorter and at end of upper median instead of the radial vein, as in *Rhinopalpa*; the abdominal margin less excavated and with but one lobe at the anal angle; precostal vein slightly bifid; cell closed by a very incipient slender curved lower discocellular. Palpi more coarsely clothed with stouter scales; antennæ shorter, club also shorter.

TYPE.—Y. Vasuki.

LARVA.—[Sabina.] Head with two erect branched-spines; segments with dorsal and lateral rows of branched-spines.

PUPA.—Suspended. Moderate sized. Head-piece projected, pointed; thorax much arched hindward; abdomen slightly convex dorsally, and with a row of fine spines, and lateral small tubercular points.

### YOMA VASUKI (Plate 328, fig. 1, 1a, b, c, ♂ ♀).

*Yoma Vasuki*, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 259.

*Rhinopalpa Vasuki*, de Nicéville, Butt. of India, etc., ii. p. 247 (1886).

IMAGO.—Male and female. Upperside. Both wings deep vinous-brown, palest on the outer margins, which are traversed by two submarginal indistinct somewhat-lunulated black lines; the disc crossed by a broad bright deep yellowish-ochreous

band, its inner-edge being sharply-defined, and somewhat irregular on the forewing, its outer-edge blurred, and on the forewing directed somewhat inwardly from above the upper median, becoming gradually narrower towards the anal angle of hindwing, but to which it does not quite reach; cilia lilacine-grey tipped with black at end of veins. *Forewing* also with three superposed subapical outwardly-oblique pale ochreous spots, the upper one being slender, the next much larger, the lowest small and speckled; below these and near the discal band are two small white spots placed above and below the upper median; across middle of the cell are two indistinct black sinuous lines and another pair at its end enclosing the discocellulars. *Hindwing* with a small more or less obscurely-defined outer-discal black spot margined with pale ochreous, placed between the lower and middle medians; the outer border and anal angle grey-speckled. *Underside*. Both wings pale greyish-ochreous-brown, slightly flushed with vinaceous-grey, and irrorated with darker brown scales; the discal band, as above, being more or less grey and speckled with brown scales, its edges also more or less sharply-defined; the basal area crossed by two similar-coloured sinuous-edged fasciæ; the submarginal lunular lines very obscure. Both wings with an outer-discal row of obscurely-defined black dots placed between the veins, those on the hindwing being slightly surrounded by pale ochreous, and the two on the forewing, representing the pair of the upperside, are entirely white; posterior angle of forewing broadly lilacine-grey speckled, and with a quadrate black spot; anal angle of hindwing also grey-speckled. *Body* and palpi above brown, beneath and legs pale yellowish-ochreous; antennæ blackish above, beneath and tip ochreous.

Expanse, ♂ ♀, 3 to 3 $\frac{1}{10}$  inches.

HABITAT.—Burma; Tenasserim.

DISTRIBUTION.—“Mr. W. Doherty found it flying rather commonly in the open country at the foot of the Arakan Yoma near Sandoway, Arakan, and has the habits of *Hypolimnas Bolina*. In Major Marshall’s collection are several specimens from Rangoon. It occurs also in Tavoy.” (de Nicéville, l.c. 248). Col. C. H. E. Adamson records it as being “found throughout Burma in the dry-season. In February, 1892, it was very common at Aloungdau Kathapa Pagoda, in the Chindwin District. It frequents thick forest, and is very difficult to catch in good order” (List 1897, 25). Capt. E. Y. Watson says it “occurred commonly in the Upper Chindwin in April, but almost invariably in bad condition, and also very difficult to catch” (J. Bombay N. H. S. 1897, 656). Capt. Watson also took it at “Beeling in Upper Tenasserim” (*id.* 1888, 6), and on the road from “Pauk to Tilin in November, and at Tilin from December to May, was very common in March, but specimens, though fresh, were terribly battered” (*id.* 1891, 41). Mr. W. Doherty took “several specimens near Momeit, Upper Burma” (P. Z. S. 1891, 285). Dr. F.

Manders records having "several specimens taken in widely different localities. It is common in Eastern Karenee, also in the forest belt between Burma and the Shan States, and appears partial to thick jungle near water. I have taken it in July, and also in January" (Tr. Ent. Soc. 1890, 525). A single male is recorded from Sinbyoodine on the Siam frontier" (J. A. Soc. Beng. 1887, 422).

### Genus APATURA.

- Apatura*, Fabricius, Illiger's Mag. vi. p. 280 (1807). Scudder, Proc. Boston Acad. Arts and Sci. x. p. 115 (1875). Moore, Lep. of Ceylon, i. p. 57 (1881). Doherty, Journ. As. Soc. Bengal, 1886, p. 109.
- Hypolimnas*, Hübner, Verz. bek. Schmett. p. 45 (1816); *id.* Samm. Exot. Schmett. ii. (1822-5). Distant, Rhop. Malay. p. 164 (1883). de Nicéville, Butt. of India, etc., ii. p. 121 (1868). Staudinger and Schätz, Exot. Schmett. ii. p. 131 (1887).
- Esoptria*, Hübner, Verz. bek. Schmett. p. 45 (1816).
- Diadema*, Boisduval, Voy. Astrolabe, Lep. p. 135 (1832); *id.* Ann. Mus. Hist. Nat. p. 187 (1833). Doubleday and Westwood, Gen. D. Lep. p. 279 (1850). Wallace, Trans. Ent. Soc. 1869, p. 27. Felder, Neues Lep. p. 25 (1861).
- Æola* (part), Billberg, Enum. Ins. p. 78 (1820).

IMAGO. Male. *Forewing* triangular; costa much arched, apex obtusely convex; exterior margin oblique, slightly angulated below the apex, concave below the middle, and slightly scalloped; posterior margin slightly recurved; costal vein extending to more than half the margin; first subcostal branch emitted at one-fifth before end of the cell, and second subcostal close to the end, third branch at one-third beyond, fourth and fifth at two-thirds beyond; cell broad, truncate at end, less than half length of wing; upper discocellular very short, outwardly oblique, middle discocellular curved inward, lower discocellular long, very slender and slightly curved outward; radials from their angles; middle median veinlet emitted at some distance before lower end of cell, lower median at half the length; submedian nearly straight. *Hindwing* broad, somewhat rounded; exterior margin very convex, scalloped; costal vein extending to the apex, much arched from the base; precostal vein short, incurved, emitted at some distance above base of subcostal; the subcostal branch emitted at one-fourth before upper end of cell; upper discocellular short, curved outward, lower discocellular long, curved outward and very slender; radial from their middle; two upper medians from lower end of cell, lower median from opposite subcostal branch; submedian slightly curved, internal vein deeply curved at the base. *Body* moderately stout, palpi porrect, second joint long, projecting half its length beyond the head, compactly squamose beneath, second joint slightly pilose at upper and inner end, third joint short,

pointed; forelegs of *male* slender, femur scaly above, hairy beneath, tibia and tarsus clothed with rather short fine hairs; forelegs of *female* long, very slender, scaly, femur with a few fine hairs beneath, tarsus spined at the tip; antennæ somewhat short, with a rather short well-formed cylindrical club; eyes naked.

LARVA.—Cylindrical. Head surmounted with two long erect branched-spines; segments armed with a dorsal and four, or five, lateral rows of branched-spines.

PUPA.—Stout. Abdomen arched, and with a dorsal and two lateral series of short, stout, sharp tubercular-points; thorax arched and obtusely angular; head-piece obtusely cleft.

TYPE.—*A. Bolina*.

MIMICRY.—Colonel C. Swinhoe, in his paper on "Mimicry in butterflies of the genus *Hypolimnias*" (Journ. Linn. Soc. Zool. 1895, p. 339) writes, "The *Bolina* group of the Nymphalid genus *Hypolimnias* contains, according to systematists, a number of species. When, however, we look at the group from a biological point of view, we find that all these species can be merged in two distinct species—*H. Misippus*, Linn., and *H. Bolina*, Linn. It is first of all necessary to gain a conception of the appearance presented by these species before the mimetic form was assumed. This we find to be still retained by the male of *H. Misippus*, which is invariably non-mimetic, and that of *H. Bolina*, which is non-mimetic in India, and in certain other localities. Occasionally the females also revert to the ancestral pattern, and resemble the black males. The non-mimetic males are very similar in appearance, while their mimetic females differ widely. The female of *H. Misippus*, however, except as a very rare variety which resembles the male in appearance, always mimics the commonest of all the *Danainæ*, i.e. *Danaïs Chrysippus*, Linn., which is common all over India, Burma, Ceylon, the Malay Archipelago, Madagascar, Aden, the West, South, and South-eastern coasts of Africa, but apparently not the interior: in all these localities *H. Misippus* also exists, the female being of the *Danaïs* colour and pattern, and where *D. Chrysippus* does not exist, *H. Misippus* is not to be found." "In Africa and at Aden there are several forms of *Danaïs Chrysippus*—some without the white-banded black apical patch to the forewings (*Danaïs Dorippus*, Klug); some possessing this marking, but characterized by white hindwings (*Danaïs Alcippus*, Cram.), and also others with the *D. Dorippus* pattern and white hindwings. All these forms are mimicked in their several localities by the females of *Hyp. Misippus*." "In India the form of female *Hypolimnias* which mimics *Danaïs Dorippus*\* (without the black and white apical patch) is also found; it is not nearly so frequently met with as the mimic of the true *Danaïs Chrysippus*,†

\* *Klugii*, Butler—See Lep. Ind. vol. i. plate 9, figs. 1, 1a.

† See Lep. Ind. i. plate 8, figs. 1a—c.

but it is not uncommon, being occasionally found nearly all over India." "In the species *Hyp. Bolina*, as we find it in Asia, the female only is mimetic, the male in all localities being of the normal form. In India the female universally mimics the common protected butterfly *Euplœa Core*,\* Cramer. The typical *E. Core* does not range very far South, one or two have been taken in Mergui, but there is no record of its more southern extension, its place being taken by other common black *Euplœas* of somewhat similar pattern. We find accordingly, that *H. Bolina* varies so as to resemble all the common *Euplœas* of the different islands of the Malay Archipelago. In Sumatra it is known as *Hyp. anomala*, and mimics *Isamia* (*Euplœa*) *singapura*."

### APATURA BOLINA.

- Papilio Bolina*, Linnaeus, Syst. Nat. x. ed. p. 479 (1758); Mus. Ulr. p. 295 (1764); Syst. Nat. xii. ed. p. 781 (1767). Clerck, Icones Ins. ii. pl. 21, fig. 2, ♂ (1764). Fabr. Syst. Ent. p. 507 (1775). *Diadema Bolina*, Wallace, Trans. Ent. Soc. 1869, p. 278 (part). Butler, Catal. Fabr. Lep. B. M. p. 96 (part) (1869). *Hypolimnas Bolina*, Kirby Catal. D. Lep. p. 224 (part) (1871). Distant, Rhop. Malay. p. 165, pl. 12, fig. 10, 12, ♂, pl. 15, fig. 12, ♀ (1883). Aurivillius, Kongl. S. Vet. Akad. Handl. 1882, p. 96. de Nicéville, Butt. of India, etc., ii. p. 123 (1886). Leech, Butt. China, etc., i. p. 131 (1892). *Apatura Bolina*, Fabricius, Illiger's Mag. vi. p. 280 (1807). Scudder, Proc. Amer. Acad. Arts and Sci. Boston, 1875, p. 115. Moore, Lep. Ceylon, i. p. 58, pl. 30, fig. 1, ♂, 1b, larva and pupa (1881). Doherty, Journ. As. Soc. Beng. 1886, p. 123. *Papilio Jacintha*, Drury, Illust. Exot. Ent. ii. pl. 21, fig. 1, 2, ♀ (1773). Donovan, Ins. China, pl. 37, fig. 1, ♀ (1798). *Apatura Jacintha*, Moore, Lep. Ceylon, i. p. 58, pl. 30, fig. 1, a, ♀ (1881). *Papilio Avia*, Fabricius, Ent. Syst. iii. i. p. 111, ♀ (1793). *Hypolimnas Charybdis*, Butler, Cistula Ent. ii. p. 432 (1883).

*Wet-season Brood* (Plate 329, fig. 1, larva and pupa; 1a, b, c, d, ♂; 1e, f, ♀).

IMAGO.—Male. Upperside rich dark purpurescent blue-black; cilia alternated with white. Forewing with an upper-discal outwardly-oblique large elongate macular white patch, which is margined with pale lilacine-blue, and more broadly surrounded by dark blue—which latter in some lights changes to brilliant cobalt-blue, commencing at or above the upper radial, and extending to or below the middle median veinlet; two or sometimes three small subapical white spots, and sometimes followed beneath by two or three, or a complete, inner submarginal series of white dots placed between the veinlets. Hindwing with a large medial-discal oval white patch irregularly margined with pale lilacine-blue, and in some lights more broadly surrounded by brilliant cobalt-blue; followed beyond by an inner

\* See Lep. Ind. i. plate 23, figs. 1b, c, d.

submarginal series of obsolescent or distinct white dots. In some varieties of the male the forewing has, also, two more or less obsolescent pale outer marginal lunular lines, and the hindwing a submarginal series of more or less obsolescent bidentate marks, and a slender marginal line, or both are more or less distinctly defined, and in others are very prominent, and bluish-white. Underside of various shades of dark olivaceous-brown. *Forewing* with a prominent bluish-white upper-discal oblique macular band extending to the costa, subapical spots and continuous row of inner-submarginal dots, followed by a prominent brownish-white submarginal row of double-lunules, widening posteriorly, and a marginal single lunular line; some bluish-white and black speckles along base of the costa and three small black-edged white spots along upper border of the cell. *Hindwing* with a variable broad prominent bluish-white transverse discal band ending in a costal spot, followed by an inner submarginal row of round white or brownish-white dots, a more or less prominent submarginal broad band formed of double conical conjoined-spots, and then a marginal linear lunular line.

Female. Upperside dark olivaceous-brown; cilia alternated with white. *Forewing* with a few basal costal blue-speckled spots, an upper-discal, oblique, more or less defined bluish-macular fascia—corresponding to the white fascia of the male—an inner submarginal series of creamy-white or brownish-white spots, the two uppermost being the largest and contiguous, followed by a submarginal double-lunular and a marginal single-lunular line. *Hindwing* with an inner-submarginal row of creamy-white or brownish-white round spots, followed by a submarginal band formed of double conical conjoined spots, and then by a marginal single lunular line. Underside paler olivaceous-brown, or ochreous-brown. *Forewing* with the inner-submarginal and outer marginal markings as on upperside, the oblique upper-discal macular fascia subobsolete and brownish-white; the basal area sometimes suffused with reddish-ochreous; the basal costal and cell-spots as in the male. *Hindwing* with a transverse discal creamy-white or brownish-white ill-defined fascia, followed by an inner submarginal row of round spots, a broad submarginal band formed of double conical continuous spots, and then a marginal lunular line. *Body* of male above dark blue-black, beneath brown; head and front of thorax above spotted with white dots; palpi blackish with a white basal tuft above and streak beneath; legs olivaceous-brown; femora beneath white streaked; body beneath white spotted; antennæ black; body and palpi of female above dark olivaceous-brown, white spotted as in male.

Expanse, ♂  $2\frac{6}{10}$  to  $3\frac{2}{10}$ , ♀  $2\frac{8}{10}$  to  $3\frac{8}{10}$  inches.

*Dry-season brood* (Plate 330, fig. 1, 1a, b, c, ♂; d, e, f, ♀).

Male. Larger than in *wet-season* brood. Upperside similar, except that the

oblique upper-discal macular band on the forewing and the broad discal band on the hindwing is more or less, or entirely, pale blue. Underside paler brown, or paler ochreous-brown than in *wet-season* brood. *Forewing* with the oblique upper-discal macular fascia either less-defined and whitish or brownish-white, or more or less obsolescent; the inner submarginal white spots distinct but smaller anteriorly, the upper two frequently also small, the two lower with black edges; costal base and cell-spots distinct; outer marginal lunular lines less defined, either brownish-white or pale brown, and obsolescent anteriorly. *Hindwing* with the transverse discal fascia ill-defined, either brownish-white or pale brown, sometimes with a few blue scales speckled medially along its inner edge; the broad submarginal band and marginal line also either brownish-white or pale brown.

Female. Upperside similar to *wet-season* brood; the basal half darker and flushed with blue in certain lights; the inner submarginal row of spots sometimes smaller, the submarginal series of double conical spots sometimes disconnected, ill-defined, and with the marginal lines obsolescent. Underside paler than the male, otherwise similar, except that all the markings are more obsolescent.

Expanse, ♂ 3 to 4, ♀ 4 $\frac{1}{10}$  inches.

*Varieties* (Plate 331, fig. 1, 1a, b, c, d, e, f, g).

*Wet-season brood.* Male. Comparatively smaller than ordinary specimens. Upperside. Both wings with somewhat smaller discal patch, both being almost or entirely powdered with lilacine-blue scales. Underside with narrower upper-discal oblique macular band on forewing and discal band on hindwing; in some examples both bands are speckled with blue scales. Bombay (fig. 1, 1a). In other male examples, from Mynpuri (fig. 1, c, d), the upperside has the patch on forewing dark blue speckled, and the patch on hindwing is uniformly black—shot in certain lights with brilliant dark blue, but showing no trace of a pale centre; and on the underside the upper-discal macular band is narrow and blue-speckled, the discal band on hindwing obsolescent and blue-speckled, and the upper costal spot absent (fig. 1, d). Other examples of male have a similar uniformly-black patch on upperside of hindwing, the underside of the hindwing showing an entire absence of the discal band, though the costal white spot is present (fig. 1, e), Khasias. Again, in another smaller example of the male (fig. f, g), with patches on upperside as in fig. 1, d, the upper-discal macular blue-speckled band on forewing is still narrower and less prominent, and on the hindwing the discal band is entirely absent, the ground-colour of the wing being quite uniform, the outer marginal markings also being almost obsolete. Khasias.

LARVA.—Head reddish-brown, armed with two long erect black branched-spines, the segments purple-brown, armed with a dorsal and five lateral longitudinal rows of reddish-brown branched-spines; legs reddish-brown.

PUPA.—Stout; purplish-brown; head-piece obtusely cleft; thorax arched and obtusely angular; abdomen dorsally arched, and with a dorsal and two lateral rows of short, stout, sharp tubercular points.

HABITAT.—Throughout India; Ceylon; Andaman and Nicobar Islands; Burma; Tenasserim; Malay Peninsula; Siam; Sumatra; Borneo; Hong Kong; W. China.

SEASONAL VARIATION, ETC.—“In India, *Bolina* is represented by several fairly well-marked forms in the male, but they are neither confined to particular localities nor constant in their characters, each form being linked to the others by numerous intermediate gradations. The female is much more constant comparatively, though it, too, shows variation in the extent of the markings, especially on the upperside. The typical male, described by Linnæus under the name *Bolina*, and figured by Clerck under the same name, and by Cramer as *Auge*—having on the underside a prominent white bar or band on each wing—so far as I am aware, usually appears during the *rainy season*. Next, there is a larger form—with paler and more uniform coloration of the underside, and the absence of pure white markings, these being irrorated with brown—this form, as far as I am aware, usually appears during the *dry season*. Again, each of these forms exhibits, but not commonly, a striking variety in which the patch on the upperside of the hindwing is uniform black, shot in certain lights with brilliant deep blue, but showing no trace of pale centring. These varieties are not casual isolated forms, but linked by numerous gradations in which the pale centring gets gradually less. In the variety allied to the smaller typical form there is a striking difference on the underside also, in extreme cases the white discal band of the hindwing and all the whitish markings of the border of both wings entirely disappear, except a white dot on the cilia in each interspace, and there appears a deep violet suffused patch on the disc just beyond the cell; the ground-colour is darker throughout, and the discal white markings of the forewing though narrower are prominent. In the variety allied to the larger form, the underside is less strikingly different, the markings are even more obscure and suffused as well as irrorated with brown, and the discal dots on both wings are more prominently tinted with violet. The female was figured by Donovan and Drury under the name *Jacinta*, and later on was described by Fabricius under the name of *Avia*. The variations of it, which are casual and inconstant, are mainly confined to the greater or less prominence of the blue macular fascia on the upperside of the forewing, and the greater or less prominence of the whitish submarginal band on the hindwing, in one extreme consisting of small conical spots in pairs between the nervules; in the other extreme these spots are greatly elongated, entirely filling the spaces between the veins, and coalescing with the discal spots towards the anal angle. On the underside, the females in all cases appear to correspond with the larger form, and not with the typical smaller form in style of markings” (L. de Nicéville, *l.c.* 124).



REARING OF LARVA.—“ Larva found, in Kanara, during August, September and October, feeding on the Goretay-Geerah (? *Portulaca* sp.). Suspends itself in houses and verandahs. Body cylindrical. Head shield-shape, broad at top, with two erect horns two-tenths of an inch long, bearing numerous tubercles surmounted by weak hairs, occiput and neck dull burnt-sienna, face ditto, mottled with black and covered with hair. Each segment bears several branched-spines arranged transversely, but the number varies—on the first segment are only two on the sides and some tubercles on the top of the second and third, one on each side of back and two on sides, with a double pair below; the fourth segment and all behind it to the twelfth, have besides the back and side spines, a single one on the middle of the back; the fourth and tenth segments have a lower double pair; the fifth segment has the double pair and a single one below, and below that some rudiments of others; the other segments have the double pair only like the second and third; the eleventh none below the line but two black ones, one in front and the other on hinder part of segment; the twelfth segment only two side ones which project backwards; these spines are all dark brownish burnt-sienna with dark tips; the colour of the segments is greyish purple-black above and below with a very dark patch between the upper pair of side spines and a dorsal black line; a thin line of burnt-sienna runs along bottom of sides between the lower tier of large spines—double on the three first segments; spiracles black just above the line; legs dull red ” (S. N. Ward, MS. Notes).

Messrs. J. Davidson and E. H. Aitken record rearing the larva in Bombay, as follows:—“ We have reared this in October, and in Karwar during July and August. They were generally found on the ground, so the food-plant was not ascertained; but they fed readily on a minute weed called by botanists *Elatostemma cuneatum*, and some eat, while others refused *Portulaca oleracea*. All we reared were of the small dark form. The large form (*Avia* or *Jacintha*) was common enough, but we did not get it by rearing. Larva cylindrical, armed with nine longitudinal rows of fine branched-spines; a single pair of longer and stouter spines on the head; colour very dark, rich brown; head light brown. Pupa dark earthy-brown, mottled with a lighter shade; somewhat angular about the head and thorax; abdominal segments armed with dorsal rows of short, sharp tubercles ” (Journ. Bombay N. H. Soc. 1890, 273).

DISTRIBUTION, HABITS, ETC.—In India “ this is, in most parts of the country, one of the commonest as well as one of the most beautiful of the butterflies. In the drier portions of Western Continental India it is rare, but even there it may occasionally be found in gardens. In the moister regions, particularly in the warm valleys and submontane tracts, it abounds, and the flash of the brilliant purple, as it opens and closes its wings while sunning itself on some flower or spray of foliage, meets the eye at every turn ” (L. de Nicéville, *l.c.* 125). “ I saw a specimen of this

insect at Kotgarh in the clutches of a large green Praying Mantis, subsequently I took several specimens. For so large an insect, it has not a very powerful flight, and is easy to capture" (*id.* Ind. Agriculturist, 1880).

In North-Western India, Col. J. W. Yerbury took it at "Campbellpore, in July, 1886; uncommon, none being taken in 1885, and only one male and two females up to 1886" (Ann. Nat. Hist. 1888, 142). Mr. W. Doherty obtained it in the "Kumaon Tarai, 1000 feet elevation, and in the forests of the Kali Valley, 2000 to 4000 ft." (J. As. Soc. Beng. 1886, 123). The Rev. J. H. Hocking records *Bolina* from the "Hot Valleys, Kangra; taken in flower gardens from May to September," and *Jacintha* from the Hills, June to September, settling upon Oak (*Q. incana*); never found in company with preceding (*Bolina*)" (P. Z. S. 1882, 241). Capt. A. M. Lang found it at "Simla, Oudh and Umballa. Frequents woods and orchards, affecting the shade of the trees" (MS. Notes, 1864). "This is one of the most gorgeous of the many living gems this land of India produces. It is a fairly large butterfly, but there are two seasonal forms—the smaller appearing, in the Central Provinces, after the hot weather and the beginning of the rains, the larger form at the end of the rains. The sight of this beautiful creature, as it opens and closes its wings while basking in the sun, affords a brilliant spectacle, especially, as is very often the case, when there are several seated within reasonable distance of one another. The male displays itself to the female in a striking manner. The latter, while flying from one place of concealment to another—for it is a shy creature as compared to the male—is usually pursued by one or two males who fly a foot or so below her, quivering their wings to the full extent of their powers. This is evidently done with the object of displaying their loveliness to the greatest advantage" (J. A. Betham, J. Bombay N. H. Soc. 1890, 281). Capt. H. B. Hellard obtained it in the "Ramgurh District, Hazaribagh, in November and December" (MS. Notes). Colonel C. Swinhoe obtained "two specimens at Karachi in July, 1882. Was not observed throughout 1879–80" (P. Z. S. 1884, 505). "Common everywhere in Bombay and the Dekkan all the year round" (*id.* P. Z. S. 1885, 129). "The smaller form (*Bolina*) taken in Mhow, July, Neemuck in November, Assirghur, October, and the larger form (*Avia*) in Mhow, September and October, Neemuck, September to November, in great plenty" (*id.* P. Z. S. 1886, 425). "This is a common enough butterfly in all the moister regions of the Bombay Presidency but nowhere have we found it in such abundance as in Kanara. It also appears to vary more here than elsewhere, and the varieties do not depend much upon season. It is true that at the beginning of the monsoon all the males are very small, not larger than *Misippus*, with the spots on the upperside more white than blue, and with a distinct broad white fascia on the underside; but two months later these may be found side by side with the most splendid specimens of the *Avia* form and

every grade between. During the dry season this butterfly is not often met with" (J. Davidson and E. H. Aitken, J. Bombay N. H. Soc. 1896, 252). "When the first showers of the monsoon have fallen in June, a large number of the females of this butterfly (*Avia*) appear, without a single male being visible. Two or three months later, males appear in great abundance in some places, followed after an interval by females. I noticed this particularly in 1878 at Uran, where the low jungle on the hillsides literally swarmed with this species, and I have at other times, without noting dates so precisely, found one sex abundant without the other. In Bombay and Poona this species is common about the close of the rainy season. It wanders little, and I have watched a fine male in the garden day after day, basking on the same bush and sucking the same flowers, fiercely chasing all rivals away, until it was old, faded, and broken, and finally disappeared" (E. H. Aitken, J. Bombay N. H. S. 1886, 134). The late Dr. A. Leith, in his MS. Notes describes the larva, as found by him, in Bombay, feeding on *Urtica interrupta* and *Sida retusa*, in August and September. Mr. (now Sir) G. F. Hampson records it from the Nilgiris (J. A. S. Beng. 1888, 354). Mr. H. S. Ferguson found it "very common in the Travancore Hills up to 3000 ft. elevation" (J. Bombay N. H. S. 191, 8). Capt. E. Y. Watson took "a few specimens at Nippur in November, and at Gersoppa Falls, Mysore, in January. Also found it very common in Madras from March to August" (J. Bombay N. H. S. 1890, pp. 4; 266). Mr. W. C. Taylor records it as "common at Khorda in Orissa" (List 1888, 5). Mr. L. de Nicéville states that it is "common in gardens in Calcutta, except in the cold weather" (J. A. S. Beng. 1885, 44). "Numerous specimens were taken at Silchar, Cachar, between April and August" (*id.* 1886, 358). Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 281). "In Sikkim, at low levels, it occurs nearly all the year round" (de Nicéville, Sikk. Gaz. 1894, 139). Col. C. H. E. Adamson records it as common throughout Upper and Lower Burma" (List 1897, 22). Signor L. Fea took it at "Meetan, Upper Tenasserim, in April" (MS. Note). Dr. F. Manders records it from the "Shan States, Burma" (Tr. Ent. Soc. 1890). It is also recorded from "Tavoy and Ponseikai" (J. A. S. Beng. 1887, 422). Dr. J. Anderson took it in Mergui in December" (J. Linn. Soc. Zool. 1886, 35). In Ceylon, Mr. F. M. Mackwood says it is "very common from the sea-board up to 6000 feet, early in the year, haunting deep cuttings through fern and brushwood lands. They are to be found in thousands and in smaller numbers all the year. Males twice as numerous as females" (Lep. Ceylon, i. 58). It is also found in the Andamans, Great Nicobar, and Tillangschong Island (P. Z. S. 1877, 585; J. A. S. Beng. 1882, 16).

It also occurs in the Malay Peninsula (W. L. Distant, Rhop. Malay. p. 165) It has been taken in Siam, at Chentaboon and Nanconchaisee (H. Druce, P. Z. S. 1874, 105). Mr. de Nicéville records it as occurring in Sumatra (J. A. S. Beng.

1895, 413). Mr. J. J. Walker, R.N., found it in "Hong Kong, but not common in gardens and elsewhere, in April and May" (Tr. Ent. Soc. 1895, 455).

Mr. C. Bartlett records it as occurring in Borneo (Sarawak Note Book (1896), p. 87).

**APATURA MISIPPUS** (Plate 332, fig. 1, 1a, ♂; 1b, c, d, e, f, ♀).

*Papilio Misippus*, Linnæus, Mus. Ulr. p. 264, ♀ (1764); Syst. Nat. xii. ed. p. 767 (1767).

*Diadema Misippus*, Wallace, Trans. Ent. Soc. 1869, p. 280. Butler, Catal. Fabr. Lep. B. M. p. 97 (1869).

*Hypolimnas Misippus*, Kirby, Catal. D. Lep. p. 225 (1871). Butler, P. Z. S. 1884, p. 481. Aurivillius, Kongl. S. Vet. Akad. Handl. 1882, p. 71. Distant, Rhop. Malay. p. 167, pl. 12, fig. 9, 11, ♂; pl. 15, fig. 11, ♀ (1883). de Nicéville, Butt. of India, etc., ii. p. 126, pl. 20, fig. 85, ♂ ♀ (1886).

*Apatura Misippus*, Moore, Lep. Ceylon, i. p. 59, pl. 29, fig. 1, 1a, b, ♂ ♀, l.c. larva and pupa (1881). Doherty, Journ. As. Soc. Beng. 1886, p. 123.

*Papilio Bolina*, Drury, Illust. Exot. Ent. i. pl. 14, fig. 1, 2 ♂ (1770). Cramer, Pap. Exot. i. pl. 65, fig. E, F, ♂ (1775).

*Apatura Bolina*, Zinken-Sommer, Nova Acta Acad. N. Cur. xv. p. 194 (1831).

*Diadema Bolina*, Moore, Catal. Lep. Mus. E. I. C. i. p. 158 (1857).

*Papilio Diocippus*, Cramer, Pap. Exot. i. pl. 28, fig. B, C, ♀ (1775).

*Eupl a Diozippe*, Hübner, Verz. Schmett. p. 15 (1816).

*Papilio Inaria*, Cramer, Pap. Exot. iii. pl. 214, fig. A, B, ♀ (1782).

*Papilio Chrysippus*, Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 3, ♀ (1776).

*Hypolimnas Alcippoides*, Butler, Annals Nat. Hist. 1883, p. 102, ♀.

IMAGO.—Male. Upperside rich dark purpurescent blue-black; abdominal margin brownish; cilia alternated with white. *Forewing* with a large bluish-white upper-discal oblique elongated oval patch, crossed by black veins, and broadly surrounded with rich dark blue in certain lights; a small similar subapical spot divided by the two lower subcostals. *Hindwing* with a large medial-discal irregularly-rounded bluish-white patch, similarly surrounded by rich dark blue. Outer margin of both wings with two very slightly-defined slender lunular lines paler than the ground-colour, those on the hindwing being speckled with pale blue at the anal angle. Underside. *Forewing* with the lower discoidal area castaneous-red, the posterior outer area dusky castaneous-brown, and the apical area browish-ochreous, greyish brownish-ochreous, or greyish-brown; upper-discal oblique bluish-white patch and subapical spot as on upperside, the former extending from the costa and more or less outwardly margined with dark dusky-brown, the latter succeeded by a sub-marginal row of decreasing white dots, and followed by a blackish-marginal fascia traversed by two slender bluish-white or bluish-grey partly-broken lunular lines; base of costal border black, and dotted with white scales; four upper white cell-spots

broad and irregularly surrounded with black. *Hindwing* reddish-ochreous, or greyish brownish-ochreous, brightest posteriorly; crossed by a broad bluish-white band extending from costal vein and ending above anal angle, where it is marked by a slender black sinuous streak, the anterior end is outwardly black-edged, and a black angled-bar extends across its middle from the costal to subcostal vein; a slender black streak edged with white extending along inner base of costal vein from the precostal; a prominent submarginal row of small white spots, followed by a marginal black fascia traversed by two prominent bluish-white or greyish-white lunular lines, similar to but broader than those on forewing. *Body* and palpi above black; front of thorax and head white spotted; first and second joints of palpi white beneath; thorax and abdomen beneath black, spotted with white; legs blackish, streaked with white; antennæ black.

Female. Trimorphic.—*First form* (fig. 1, b, c).—*Diocippus*, Cramer.—Upperside reddish-ochreous; cilia black alternated with white. Forewing with the apical half blue-black, commencing from base of costa and gradually widening across apex of cell and then curving downward to posterior angle, across which is an upper-discal outwardly-oblique series of five bluish white spots placed between the veinlets, the upper spot very small and linear, the second and third elongated and subquadrate, the fourth generally shorter and either subquadrate or ovate, the fifth shorter and rounded; this series is preceded on the costa by a slender white streak and two or three obscure speckled streaks below the subcostal, and followed by a subapical curved series of four small white spots of which the two lowest are minute; beyond are two marginal rows of slender bluish-white disconnected linear spots, which latter are smallest and less defined anteriorly and posteriorly. *Hindwing* with a large medial upper-discal black spot placed beneath the costal vein, and a marginal black band traversed by an inner row of very small obscure ochreous or ochreous-white spots, and an outer series of whiter disconnected slender lunules; sometimes the discocellular veinlet is slightly speckled on each side by black scales, and its contiguous black spot of the underside is also slightly apparent. Underside. *Forewing* with the lower half paler reddish-ochreous posteriorly and the apical area beyond the upper-discal spots yellowish-ochreous, the medial area from base of costa across the disc to posterior angle only being black; base of costa white-speckled, subcostal blue-white cell-spots large and prominent, the upper-discal oblique white spots, the subapical and lower submarginal spots, and marginal lunules, as above, prominent. *Hindwing* yellowish-ochreous, the disc more or less slightly smeared between the veins with chalky-white; a black slender streak at base of costal vein; a medial subcostal angled-bar and a large black spot at outer end of cell; a submarginal row of white dots, marginal black band, and its two traversing series of lunules broader and more prominently white or ochreous-white than on upperside.

*Body* and palpi above black; thorax and abdomen speckled with bluish-white scales; head and palpi white spotted; thorax beneath reddish-ochreous spotted with white; abdomen beneath with ochreous-white bands; legs black, femora white beneath. Expanse, 3 to  $3\frac{6}{10}$  inches. A mimic of *Limnas Chrysippus* (Lep. Indica, i. pl. 8).

*Second form* (fig. 1, d).—*Alcippoides*, Butler.—Differs from the first form of female, both on the upper and underside, in the hindwing having a distinctly defined broad chalky-white discal area. Expanse,  $3\frac{6}{10}$  inches. Nilgiris (Coll. Hampson). A mimic of *Limnas Alcippoides* (Lep. Indica, i. pl. 9, fig. 2, a, b, c).

*Third form* (fig. 1, e, f).—*Inaria*, Cramer.—Differs from the first and second form, on the upper and underside of the forewing, in the absence of the black ground-colour on the middle of the apical area, and the oblique upper-discal white band, these parts being of the same reddish-ochreous as the other parts of the wing. Expanse, 3 to  $3\frac{4}{10}$  inches. Mhow; Ahmednuggur; Bombay. A mimic of *Limnas Klugii* (Lep. Indica, i. pl. 9, fig. 1, 1a).

*LARVA*.—"After *first moult*; half inch long. Ground-colour black; dorsal line dark and faintly marked; segmental incisions dark slate-colour; back transversely banded on each segment with glossy pale brown bead-shaped protuberant dots; abdomen dark olive-brown; legs brick-red; head brick-red, furnished with two long black thick branched-spines, terminating in a very fine silky hair; stigmata black, ringed with olive; segments armed with ten longitudinal rows of dirty-white transparent branched-spines two lines long—one on either side of dorsal line, one at the base of legs, and three intermediate; a somewhat indistinct dark wavy line just below the first and second rows of spines, counting from dorsal line; anal segment with only two spines. After *last moult*; length one to one and a half inch; fat, cylindrical, attenuated anteriorly; ground-colour and description as above. Feeds on the garden Purslane (*Portulaca oleracea*), of which it eats the whole plant. In habits it is gregarious and voracious; when disturbed they emit a green fluid from the mouth. Went into pupa September 3rd."

*PUPA*.—"Pendulous. Short and thick; light brown, without metallic spots, variegated and streaked with bistre, particularly towards the head and tail. *IMAGO*.—Emerged September 10th" (Capt. H. L. de la Chaumette, MS. Notes, Lucknow, 1860).

*HABITAT*.—Throughout India up to 6000 feet in the Himalayas; Ceylon; Andaman and Nicobar Islands; Burma; Siam; Tenasserim; Malay Peninsula; Sumatra; Java; Borneo; Hong Kong; Formosa; etc.

TWO FORMS OF FEMALE reared from eggs of one parent.—Mr. J. A. Betham writes, "I have reared from eggs laid by one and the same female—which was, herself, of the *D. Dorippus* type—both the common form which mimics *D. Chrysippus* and the less common form which mimics *D. Dorippus*. I watched her as she laid her eggs and

succeeded in securing four, three of which hatched and produced spiny-looking black larvæ. They fed on *Portulaca quadrifida*, a common weed, in the Central Provinces, fond of garden paths. One of the larvæ received an injury, and just as it should have emerged, the colours and markings—which were of a female of the common type—were visible, it succumbed. The other two came out all right and proved to be also females; but one was of the common *D. Chrysippus* type, while the other resembled the *D. Dorippus* type, and had the white macular band faintly visible; examples of a most interesting case in which two different types were produced from one parent. The eggs were laid on October 16th and were hatched in three or four days. The larvæ turned to pupæ on November 7th and 8th, and emerged on November 19th and 20th” (Journ. Bombay Nat. Hist. Soc. 1890, 282).

HERMAPHRODITE.—A hermaphrodite, the right wings of which are male, and the left wings female (*Diocippus* form), taken in Kanara, S. India, by the late Mr. S. N. Ward, is in the British Museum.

DISTRIBUTION, HABITS, ETC.—“This butterfly appears to be almost as universally met with in India as is *Danaïs Chrysippus*, which is the model of the first form of its female. This form of the female (*Diocippus*) is the most widely distributed, probably occurring everywhere with the male. I am aware of its occurrence in S. Africa, Aden, Karachi, Simla, Oudh, Malda, Calcutta, Bombay, North Kanara, the Nilgiris, Bangalore, Trichinopoly, Travancore, Ceylon, Katchall in the Nicobars, the Malay Peninsula, and Batavia. At Aden, and Ootacamund, Nilgiris, and probably elsewhere in India, a variety of this form of female occurs with the disc of the hindwing on the upperside white; it mimics the variety of *Danaïs Chrysippus* named *Alcippus* [*Alcippoides*], which also has white on the hindwing. A second form of female (*Inaria*)—differing from the ordinary female in the absence of the black ground-colour at the apex of the forewing, and of the oblique white band, these parts being of the same ferruginous colour as the other parts of the wing—occurs less commonly than the other, examples of it have been taken in S. Africa, at Aden, Karachi, Bombay, Rajputana, Oudh, Malda, Calcutta, Bhadrachallum, Madras, Bangalore, Ceylon, and Java. Its model is an unnamed form of *Danaïs Dorippus* [Klugii], in which the hindwing is entirely red” (L. de Nicéville, Butt. India, ii. 127). In North-Western India, Col. J. W. Yerbury took it at “Campbellpore, in November and December. Rare, only four taken in all, three males and one female. Flew to the lights at night during Mess” (P. Z. S. 1886, 359). Capt. H. B. Hellard obtained it at Allahabad (MS. Notes). Mr. W. Doherty obtained it at Almora, 6000 feet, and Lower Gori, 2500 feet, Kumaon (J. A. S. Beng. 1886, 123). The Rev. J. H. Hocking records it from Kangra (P. Z. S. 1882, 241). Capt. A. M. Lang found it “tolerably abundant in Oudh and at Umballah in the rainy season (autumn), and well into the winter. Larva reared on *Portulaca oleracea*” (Ent. Mo. Mag. 1864,

133). "The commonest butterfly in Lucknow. The larvæ I have reared by hundreds on *Portulaca oleracea*" (Capt. Chaumette, MS. Notes). Col. C. Swinhoe records it as "fairly common at Karachi in August and September; the female mimics *Limnas Dorippus* more commonly than *L. Chrysippus*. Also taken in Mhow, from September to February; the females all mimic *L. Chrysippus*" (P. Z. S. 1884, 505; *id.* 1886, 425). "In Bombay and the Dekkan, it is common everywhere throughout the year. Very plentiful in the winter; the female commonly has the coloration and markings of *L. Dorippus*" (*id.* P. Z. S. 1885, 129). "On the wing, the male of *Misippus* is a far more active insect than *Bolina*; it is a most pugnacious butterfly, perching on the tops of bushes and darting forward to attack any other butterfly that may fly past; but I have found that when crippled and put at liberty it speedily falls a prey to the first bird that sees it. In consequence of these fighting propensities the wings often become battered and torn, although apparently without greatly diminishing the activity of the insect" (*id.* Journ. Linn. Soc. Zool. 1895, 339). Mr. J. A. Betham says "the male of this butterfly is a pugnacious little insect, and has a rapid flight. The female not only mimics the common form of *Danaïs Chrysippus*, but also the more uncommon ones which are known as *D. Alcippus* and *Dorippus*. The female mimics these two uncommon forms exactly, but is commoner in these forms than the type it mimics. Both the common form which mimics *D. Chrysippus* and the less common form which mimics *D. Dorippus*, I have reared from eggs laid by one and the same female, which was, herself, of the *D. Dorippus* type. I watched her as she laid her eggs and succeeded in securing four, three of which hatched and produced spiny-looking black larvæ. They fed on *Portulaca quadrifida*, a common weed, in the Central Provinces, fond of garden paths. One of the larvæ received an injury, and just when it should have emerged—the colours and markings which were of a female of the common type, were visible—it succumbed. The other two came out all right and proved to be also females, but one was of the common *D. Chrysippus* type, while the other resembled the *D. Dorippus* type, and had the white macular band faintly visible. The eggs were laid on October 16th and were hatched in three or four days; the larvæ turned to pupæ on November 7th and 8th, and emerged on November 19th and 20th" (Journ. Bombay Nat. Hist. Soc. 1890, 282). Messrs. J. Davidson and E. H. Aitken write, "Not a specimen of this was seen in Karwar until September, when it suddenly became very common; but we got no larvæ. In Bombay and the Dekkan we have often found it at the end of the rains, on *Portulaca oleracea*, commonly cultivated by the natives as a pot-herb" (J. Bombay N. H. S. 1890, 273). "This species affects more open countries than *Bolina*, and is, perhaps, for that reason, not nearly so common in Kanara. During the rainy season we have never seen it, but it begins to appear in September or October and continues till about the end of the year. We have twice met with the



form of female which mimics *D. Dorippus*. The larva differs little from that of *Bolina*. We have never reared it in Kanara" (*id.* Journ. Bomb. N. H. S. 1896, 253). Mr. G. F. Hampson obtained it in the "Nilgiris, three forms of female occurring, mimicking *L. Chrysippus*, *Alcippus*, and *Dorippus*" (J. A. S. Beng. 1888, 354). Mr. H. S. Ferguson found it "common in Travancore; only one form of female occurs mimicking *L. Chrysippus*" (J. Bombay N. H. S. 1891, 8). Capt. E. Y. Watson took "numerous males at Kadur and Banavar in November, and at Gersoppa Falls, Mysore, in January. Also other specimens in Madras, in March, April, July and August, not so common as *Bolina*" (*id.* 1890, pp. 5, 266). Mr. W. C. Taylor records it from "Khorda, in Orissa, the form of female mimicking *D. Chrysippus* common, the form mimicking *D. Klugii* very rare" (List 1888, p. 5). Mr. L. de Nicéville says it is "much rarer in Calcutta than *Bolina*. Both forms of female occur here. The larva feeds on *Portulaca meridiana* in Calcutta" (J. A. S. Beng. 1885, 44). "In Sikkim it is very rare. The only females thence that I have seen have been of the first form, *Diocippus*" (*id.* Sikk. Gazetteer, 1894, 139). Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 281). Col. C. H. E. Adamson found it "not nearly so common in Lower Burma as *Bolina*; but is very common in the dry zone of Central Burma" (List 1897, 22). Dr. F. Manders records it from the "Shan States, Burma" (Tr. Ent. Soc. 1890).

In Ceylon, it is "found at all elevations. In the low country during September they are particularly numerous; this and the following month appears to be the chief time of appearance. Larva feeds on *Abutilon*, *Abelmoschos*, etc." (Lep. Ceyl. i. 59). Capt. F. J. Hutchison, in letter from Colombo, dated October 12th, 1869, writes, "I have caught a male hovering round a female resembling *D. Chrysippus*, and have also caught the male in copula with a female of the same fulvous colour, but without the black tip and white bar on the forewing." Mr. W. Doherty records it from the "Andamans, a male taken at Mount Harriet, near Port Blair. Also both sexes from Kar Nicobar, the female being a mimic of *D. Chrysippus*" (J. A. S. Beng. 1886, 258). It has also been taken on "Nankowri and Katschall, Nicobars" (de Nicéville, *id.* 1882, 16).

It also occurs in the Malay Peninsula (Distant, Rhop. Malay. 167). "In Sumatra it is very common, and abounds in open places, on roads, near houses, and especially in newly-cut tobacco fields. The female is of the form *Diocippus*; the form which mimics *D. Klugii*, is not found in Sumatra, neither does it mimic the white aberration of *D. Chrysippus* (*Alcippus*), which is found in Sumatra" (L. de Nicéville, J. A. S. Beng. 1895, 413). Dr. Horsfield obtained many specimens in Java, the female being a mimic of *D. Chrysippus*. Messrs. W. B. Pryer and D. Cator record it from N. Borneo (Brit. N. Borneo Herald, 1894, 260). It also occurs at Sarawak (E. Bartlett, Note Book, 1896, 87). Mr. H. Druce records it from "Chentaboon,

Siam" (P. Z. S. 1874, 106). Mr. J. J. Walker, R.N., obtained "a single male near Kowloon, Hong Kong" (Tr. Ent. Soc. 1895, 455). Mr. Robt. Swinhoe obtained several specimens in Formosa (P. Z. S. 1866, 359). We possess four of these Formosan specimens, the males on the upperside of the forewing, having the lower base of the cell and a little below the median vein to middle of the disc slightly coloured with deep reddish-ochreous scales—or the entire lower half of the cell and broadly to middle of the disc and the submedian is densely covered with red scales, the two marginal series of lunules on the hindwing are also prominent and bluish-white. In the female, the upperside of the hindwing has the veins thickly black, and their discal interspaces speckled with black scales, these scales almost covering the area posteriorly and merging into the black of the marginal border, the costal black spot is also large. Mr. H. E. Hobson took similar specimens in North Formosa (P. Z. S. 1877, 812).

INDO-MALAYAN SPECIES.—*Apatura incommoda* (Hypolimnas incommoda, Butler, Trans. Linn. Soc. Zool. 1877, p. 543. Distant, Rhop. Malay. p. 167, pl. 17, fig 8, 9, ♂ ♀ (1883). *Habitat.* Malay Peninsula.—*Apatura Labuana* (Hypo. Labuana, Butler, Cist. Ent. ii. p. 432, ♀ (1879). *Habitat.* Labuan, Borneo.—*Apatura Kesia* (Hypo. Kesia, Butler, Proc. Zool. Soc. 1877, p. 812, ♀; *Syn.* Hypo. Priscilla, Butler, *id.* p. 812, ♀. *Habitat.* Formosa.—*Apatura Philippensis* (Hypo. Philippensis, Butler, Cist. Ent. i. p. 243 (1874). Semper, Reis. Phil. Lep. p. 130, pl. 23, fig. 7, 8, ♂; pl. 24, fig. 1—8, ♀ (1886). *Habitat.* Philippines.—*Apatura Perimele* (Pap. Perimele, Cram. Pap. Exot. i. pl. 65, fig. C, D; pl. 67, fig. B, ♀ (1775); *Syn.* Pap. Proserpina, Cram. iii. pl. 218, fig. C, D, ♀ (1779). *Habitat.* Java.—*Apatura Auge* (Pap. Auge, Cram. Pap. Exot. ii. p. 141, pl. 190, fig. A, B (1777). Herbst, Nat. Schmett. ix. pl. 244, fig. 1, 2 (1798). *Habitat.* Amboina.—*Apatura Anomala* (Hyp. Anomala, Wallace, Trans. Ent. Soc. 1869, p. 285, ♂ ♀. Distant, Rhop. Malay. p. 169, pl. 41, fig. 1, 2, 3, 4 (1883). Semper, Reis. Phil. Lep. pl. 23, fig. 1—6, ♂ ♀. *Habitat.* Malay Peninsula; Sumatra; Java; Philippines.—*Apatura Discardia* (Hypo. Discardia, Weymer, Stett. Ent. Zeit. 1885, p. 264, pl. 1, fig 6. *Habitat.* Nias Island.

### Genus PENTHEMA.

*Penthema*, Doubleday, Gen. D. Lep. pl. 39 (1847). Moore, Catal. Lep. Mus. E. I. C. i. p. 160 (1857). de Nicéville, Butt. of India, etc., ii. p. 144 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 135 (1887).  
*Diadema* (sect. 2) *Penthema*, Westwood, Gen. D. Lep. ii. p. 281 (1850).

IMAGO.—Male. Wings very large, broad; upperside smoothly-scaled, except at base of hindwings; underside smoothly-scaled. *Forewing* elongatedly-triangular; costa evenly arched, apex rounded; exterior margin very oblique, uneven, posterior

angle rounded; posterior margin nearly straight; cell large and broad; first subcostal branch emitted at one-fifth before end of cell, second at a short distance before the end, third at nearly half-way beyond the cell and ending on the costa before the apex, fourth reaching the apex; upper discocellular very short and outwardly-oblique; middle discocellular twice as long, inwardly-oblique and slightly curved; lower discocellular outwardly-recurved and emitting a short spur at upper end into the cell; middle median emitted at considerable distance before lower end of cell; submedian vein slightly recurved. *Hindwing* broadly ovate, very convex externally; outer margin slightly scalloped; precostal vein slightly incurved; costal vein curved upward and extending close along the margin; discocellulars outwardly-oblique; middle median emitted immediately before lower end of cell; submedian and internal vein slightly recurved. *Body* moderately stout, abdomen rather long; palpi ascending, second joint reaching to the vertex and densely-clothed with hair-scales, which are longest at the sides and tip above; apical joint rather long and cylindrical, smoothly-scaled; antennæ long, with a gradually-formed very slender club; eyes naked; forelegs of male slender, clothed with rather short fine silky-hairs; forelegs of female coarsely-scaled above, more coarsely beneath, tarsus rather thick, joints laterally spined at the tip.

TYPE.—P. *Lisarda*.

**PENTHEMA LISARDA** (Plate 333, fig. 1, 1a, b, ♂ ♀).

*Diadema Lisarda*, Doubleday, *Annals and Mag. Nat. Hist.* 1845, p. 233.

*PentHEMA Lisarda*, Doubleday and Westwood, *Gen. D. Lep.* ii. p. 281, pl. 39, fig. 3 (1847-50).  
Moore, *Catal. Lep. Mus. E. I. C.* i. p. 160 (1857). Wood-Mason, *Journ. As. Soc. Bengal*, 1881, p. 86, pl. 3, fig. 1, ♂. de Nicéville, *Butt. of India, etc.*, ii. p. 144 (1886). Staudinger and Schätz, *Exot. Schmett.* ii. p. 135 (1887).

*Nymphalis Euphrone*, Westwood, *Cabinet of Oriental Entom.* p. 55, pl. 27, fig. 1 (1848).

IMAGO.—Male and female. Upperside purpurescent brownish-black, the forewing being slightly flushed with blue in certain lights; cilia alternated with white. *Forewing* with an olivescence-white streak along lower base of the cell, two obliquely-superposed longitudinal streaks before end of the cell, a discal curved series of seven streaks longitudinally disposed in the interspaces from the upper subcostal to the submedian vein, the upper four narrowly-elongated and black-speckled outwardly, the fourth shortest, the next three broader and increasing in length, the lowest being the broadest and cleft at its outer end, and somewhat bent below the cell; a narrower longer streak also bordering the posterior margin below the submedian vein; beyond is an outer-discal transverse row of six rounded spots, the upper one the smallest; followed by a parallel submarginal row of seven almost-quadrate spots,

the lowest broken longitudinally across its middle. *Hindwing* with an olivescence-white entire cell-area, an elongate discal streak between each interspace from the costa to abdominal margin, the three lowest very wide; beyond is an outer-discal series of six oval spots, the upper two being partly, or quite, confluent with its discal streak, followed by a submarginal row of seven decreasing quadrate spots; the setose clothing of the median and submedian interspaces whitish. *Underside*. *Forewing*, ground-colour basally dark purpurescent ochreous-brown, almost black, brighter and paler ochreous-brown apically; with markings as on upperside, of a bluish-white colour. *Hindwing* rich dark brownish-ochreous, with similar markings as on upperside, except that the streak in the costal interspace and in the lower interspaces are more or less obsolescent; the outer-discal spots smaller, except the upper which is larger, and the submarginal spots also larger, and all the markings are of a sullied ochreous-white. *Thorax* and abdomen above greyish-black, hair-clothing of thorax and base of abdomen grey; front of thorax and head black and spotted with white; palpi black, streaked with white at the sides; thorax and abdomen beneath blackish; sides of abdomen greyish-white; legs black, femora beneath white; antennæ black.

Expanse, ♂ ♀ 5 to 6 inches.

**HABITAT.**—Sikkim; Assam; Silhet; Cachar; Munipur; Daffa and Naga Hills; Upper Burma.

**DISTRIBUTION.**—"Occurs commonly in deep forest in Sikkim in the summer, and appears to be single-brooded. Mr. S. E. Peal has taken it at Sibsagar, and Mr. J. L. Sherwill at Jorebat, in Assam. It also occurs in Silhet, Munipur, the Daffa and Naga Hills" (de Nicéville, l.c. 145). Mr. J. Wood-Mason obtained "numerous specimens in the forests near Silcuri, Cachar, in July and August, and one at the foot of the North Cachar Hills in August" (J. A. S. Beng. 1886, 558). "It is not very rare in Sikkim in May and June at 2000 to 4000 feet elevation" (H. J. Elwes, Tr. Ent. Soc. 1888, 351). "Major J. F. M. Fawcett has taken it at Singla, Sikkim, at 2000 feet elevation in May, and Mr. G. C. Dudgeon in Daling at 1500 feet in May and June commonly. It is single-brooded. I possess specimens from Upper Burma" (de Nicéville, Sikk. Gaz. 1894, 140). "It occurs in the Chin Hills very rarely, in February" (*id.* Journ. Bombay N. H. Soc. 1899).

**PENTHEMA DARLISA** (Plate 334, fig. 1, 1a, b, ♂ ♀).

*PentHEMA Darlisa*, Moore, Proc. Zool. Soc. 1878, p. 829. Wood-Mason, Journ. As. Soc. Bengal, 1881, p. 87, pl. 3, fig. 2, ♂. de Nicéville, Butt. of India, etc., ii. p. 145 (1886).

**IMAGO.**—Male and female. *Upperside*. Differs from *P. Lisarda* in having the ground-colour darker, the forewing also more distinctly flushed with glossy-blue in

certain lights. *Forewing* with similarly-disposed markings, but all being smaller and of a distinct virescent bluish-white, those within the cell being very small, short and oval, the lower broken into two portions, the discal series also very small and short, except the lower, which is either elongate and slender in the middle or divided into two portions; the two outer series of spots are somewhat smaller, and the submarginal row cordate in shape; the posterior marginal streak is entire, but its base is tinged with pale dull straw-yellow. *Hindwing* with similarly-disposed markings, but all of a pale sullied straw-yellow; the cell-area divided into either two or three streaks; the discal streaks shorter and narrower, and in the female are coalescent with the outer-discal spots; no streak present above the subcostal; the outer-discal oval-spots are larger, and the submarginal spots much larger, conical, and deeply excavated externally; the setose clothing of the median and submedian interspaces brown. Underside; ground-colour as in *P. Lisarda*. Forewing with the markings, as on upperside, virescent bluish-white. Hindwing with the markings, as on upperside, those of the female being broader, and sullied ochreous-white.

Expanse, 5 to 5 $\frac{1}{10}$  inches.

HABITAT.—Burma; Upper Tenasserim.

DISTRIBUTION.—“Fairly common in high forests throughout Burma” (de Nicéville, Journ. Bombay N. H. S. 1899). “Capt. C. T. Bingham obtained numerous specimens in the Thoungyeen forests in Upper Tenasserim” (*id.* Butt. India, ii. 145). Col. C. H. E. Adamson obtained “a single specimen near the Siamese frontier in Tenasserim, in March. It had settled on some elephant dung” (List 1897, p. 22). Mr. W. Doherty obtained “specimens at the foot of the Karen Hills” (P. Z. S. 1891, 276).

**PENTHEMA BINGHAMI** (Plate 335, fig. 1, 1a, ♂).

*PentHEMA Binghami*, Wood-Mason, Journ. Asiatic Soc. Bengal, 1881, p. 87, pl. 4, fig. 1, ♂. Butler, Ann. Nat. Hist. 1882, p. 372. de Nicéville, Butt. of Indi, etc., ii. p. 146, front plate, fig. 121, ♂ (1886).

IMAGO.—Male. Upperside. Differs from *P. Darlisa*, on the *forewing*, in the absence of the cell and lower-discal markings, their positions and shape, however, being apparent by slightly paler spaces than the purpurescent brownish-black ground-colour; the oblique upper-discal spots are black-speckled and less prominent, and the two outer rows of bluish-white spots are less sharply defined. On the *hindwing* the cell and discal streaks are also absent; the outer-discal and submarginal spots are of a pale sullied straw-yellow, and are of the same size and shape as in *Darlisa*, the outer end of the lower-discal streaks being also present; the

setose clothing of the base is more thickly developed and of a dark brown colour; the hairy clothing of thorax and base of abdomen being also dark brown. Underside. Ground-colour somewhat darker than in *Darlisa*. Markings as on upperside, those of the forewing deeper bluish-white, those on the hindwing sullied ochreous-white.

Expanse, ♂ 5 inches.

HABITAT.—Upper and Middle Tenasserim.

DISTRIBUTION.—The type was taken by Capt. C. T. Bingham in the Thoungyeen forest, Upper Tenasserim. “Mr. T. A. Hauxwell obtained a male in the Daunat Range and another in the Thoungyeen Valley, both in April. I have a single male taken in the Yunzalin Valley, Middle Tenasserim, in April” (de Nicéville, J. Bombay N. H. S. 1899).

CHINESE SPECIES.—*Penthema Michallati*, Janet, Bull. Soc. Ent. France, 1894, p. 225. *Habitat*. Tonkin.—*Penthema Gallorum*, Obërthur, Bull. Soc. Ent. Fr. 1897, p. 175, fig. 2. *Habitat*. Tonkin.—*Penthema formosana* (*Isodema formosana*, Rothschild, Nov. Zool. v. p. 603, figure (1898). *Habitat*. China.

### Genus DOLESCHALLIA.

*Doleschallia*, Felder, Neues Lep. p. 14 (1861). Moore, Lep. Ceylon, i. p. 38 (1881). Distant, Rhop. Malay. p. 87 (1883). de Nicéville, Butt. of India, etc., ii. p. 267 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 129 (1887).

IMAGO.—Male. Wings short, broad. *Forewing* triangular; costa very convex, its base slightly excavated, apex pointed; exterior margin slightly sinuated, broadly and obtusely angulated outward below the apex, the middle concave and posterior angle rounded; posterior margin slightly recurved; costal vein extending to two-thirds the margin; first subcostal branch emitted at one-fifth before end of the cell, second branch at a short distance before the end, third at fully one-third beyond and ending at the apex; upper discocellular very short, middle discocellular rather short and concave; cell open, very broad; median veinlets widely separated, upper much arched from the base; submedian vein nearly straight. *Hindwing* triangular; base of anterior margin broadly lobate, apex obtuse; exterior margin obliquely convex, slightly sinuated and produced hindward at end of submedian into an elongated tail; abdominal margin convex basally and concavely divergent to anal angle; precostal vein bent outward towards the end; costal vein much arched and extending to apex; radial emitted at some distance from base of subcostal branch; cell open; lower median emitted from opposite base of radial; base of wing thickly clothed with longish hairs, which, along the submedian and lower

abdominal area are more dense and longer, and enclose a broad bare scaled-space on the middle of abdominal margin. *Body* short, stout, thorax and base of abdomen clothed with woolly hairs; palpi large, porrect, flattened beneath and clothed with appressed scales, hairy above, apex pointed; fore tarsus of *male* slender, compactly hairy; fore tarsus of *female* slender, smoothly-scaled, femur fringed beneath with very fine silky hairs, tarsal joints with lateral spines at tip; antennæ with a well-developed club; eyes naked.

LARVA.—Elongated, somewhat slender; head armed with two erect branched-spines; segments armed with a dorsal, a subdorsal, and lateral rows of branched-spines.

PUPA.—Stout; dorsum arched, thorax elevated and rounded posteriorly, oblique in front; head-piece produced into two pointed processes.

TYPE.—D. Bisaltide.

**DOLESCHALLIA INDICA** (Plate 336, fig. 1, 1a, b, c, ♂ ♀; fig. 2, 2a, b, ♂, larva and pupa).

*Doleschallia Bisaltide*, Moore, Lep. of Ceylon, i. p. 38, pl. 19, fig. 1, 1a, ♀; 1b, larva and pupa (1881), nec Cramer.

*Doleschallia Polibete*, de Nicéville, Butt. of India, etc., ii. p. 268 (1886), nec Cramer. Davidson and Aitken, Journ. Bombay N. H. S. 1896, p. 257, pl. 3, fig. 2, 2a, larva and pupa.

IMAGO.—Male and female. Upperside olivescient brownish-ochreous; cilia alternately edged with white. *Forewing* with the apical half black, its lower edge curving from the subcostal irregularly across upper end of cell and the disc, thence decreasing in intensity to base of exterior margin, and sometimes enclosing a small ochreous spot between the upper and middle medians; an oblique subapical sinuous-edged broad yellowish-ochreous band extending from the costa, this band having a large somewhat quadrate outer lower end, which is either slightly connected or entirely separated from the inner portion in both sexes, or in some males from Kanara and Tenasserim, the lower end is almost obsolete, being present only as an obscure speckle or a similar slender lunule, and in some Tenasserim females the band is entire; the upper discal area from the black band is broadly yellowish-ochreous merging posteriorly into the darker ground-colour. *Hindwing* with the anterior margin broadly dusky olivescient-brown, a more or less distinct black upper and a lower outer-discal dot, and two wavy marginal lines, the inner line diffusely-speckled, the outer linear. Underside. Male. Ground-colour either dark rich reddish-ochreous, ochreous-brown, olive-brown, or purpurescent brownish-ochreous (presumably *wet-season* brood), obliquely fasciated with grey or chalybeate lilacine-grey. Both wings crossed by a discal

slender black line, which is sinuously bent inward to the costa of the forewing, the line being outwardly edged by dusky grey scales, which widen out and are whitish at the costal end, and inwardly edged by a pale grey line; the inner-discal area speckled with grey and black scales. *Forewing* also with two prominent black-edged silvery-white sinuous bars, or two similar-shaped obsolescent bars, crossing middle of the cell, and a small white spot below the cell; a broad sinuous patch of the dark ground-colour outwardly bordering the discocellulars; beyond is a submarginal row of more or less distinct, or obsolescent, blackish-edged white dots, the two lower ocellated, the lowest being bipupilled, the upper spot ending on the costa in a larger white dentate spot; followed by a marginal indistinct slender grey-speckled brown sinuous line. *Hindwing* also with a small similar prominent silvery-white dentate spot, or an obsolescent spot, near lower end of cell and one also above the cell; beyond is a submarginal series of two upper-discal ocelli placed in the subcostal and radial interspaces, and a lower-discal ocellus in the middle and lower median space, the two intervening interspaces sometimes obscurely showing each a smaller pale spot and central dot; outer border with a marginal indistinct slender sinuous brown line, which is more defined and outwardly broadly grey-speckled posteriorly and terminates in a black speckled patch at caudal end. Female. Ground-colour duller purpurescent brownish-ochreous, or of various shades of dark olivescient purplish-brown or olive-brown (presumably *wet-season*), with markings as in male, but less defined, the cell marks being obsolescently-white or yellowish-white, or the ground-colour is uniformly brownish-ochreous with the basal marks of the ground-colour (presumably *dry-season* brood). *Body* and palpi above olivescient-brownish ochreous; palpi beneath and pectus white; body beneath and legs brown.

Expanse, ♂  $2\frac{8}{10}$  to 3, ♀  $3\frac{4}{10}$  inches.

LARVA.—Elongated, somewhat slender; head armed with two erect branched-spines; segments armed with a dorsal, a sublateral, and lateral rows of branched-spines. Colour of segments and spines purplish-black, with a lateral series of white quadrate spots.

PUPA.—Stout; dorsum arched; thorax elevated and rounded posteriorly, oblique in front; head-piece produced with two pointed processes. Colour pale reddish or reddish-purple, marked with black dots and strigæ.

HABITAT.—N.E. and South India; Ceylon; Burma; Tenasserim.

DISTRIBUTION, HABITS, ETC.—This “is a common species at low elevations in Sikkim, and occurs also in Assam and Silhet” (de Nicéville, *l.c.* 269). In Sikkim it is “a common species up to 4000 feet elevation, from April to December. It settles on rocks and banks of earth with wings closed, when it is hard to see, but is not shy” (H. J. Elwes, *Tr. Ent. Soc.* 1883, 366). “The larva is said by Mr. G. C.



Dudgeon to feed on various species of Nettles, and is very conspicuous and common on the Tuckvar Spur at 3500 feet elevation" (de Nicéville, Sikkim Gaz. 1894, 147). Specimens are recorded from "Silcuri, Cachar, taken in June" (J. A. S. Beng. 1886, 362). Col. C. Swinhoe records it from the Khasias" (Tr. Ent. Soc. 1893, 239). Messrs. Davidson and Aitken record it from the North Kanara District as occurring "from August onwards, when the males may be found basking on the Hill tops, but we very rarely saw a female, and all our specimens of that sex were bred. We have found eggs and larva in September and October, on a species of *Eranthemum*, which belongs to the same natural order as the food-plants of all the *Junonias* and *Kallima*. The eggs are laid in batches, and the larva are gregarious" (Journ. Bombay N. H. S. 1896, p. 257). A male from Kanara, S. India, is in Col. Swinhoe's and our own collection. Mr. H. S. Ferguson took it in Travancore, where he found it "rare, two only being taken, one on the Hills, and one near Trevandrum" (*id.* 1891, 10). In Ceylon, according to Mr. F. M. Mackwood's Notes, "It is scarce; found only from about 2000 to 4000 feet range." Capt. Hutchison took it in "February and August in the edges of the low country forest paths in the Eastern Province" (Lep. Ceylon, i. 38). Col. J. W. Yerbury obtained specimens at Kandy, which are now in the British Museum. In Burma, Lieut. D. Thompson took it in "Chin-Lushai Country during the Expedition from the Chittagong side, in the cold weather of 1889-90" (J. Bombay N. H. S. 1890, 2). Dr. N. Manders records it as "an uncommon species, in the Shan States at 3000 to 5000 feet elevation" (Tr. Ent. Soc. 1890, 525). Col. C. H. E. Adamson says "this insect was common about the villages on the banks of the HOUNGDRAW River in October, 1880, where it settled on the mud under and near the native houses. I have also taken it near Bhamo" (List 1897, 26). Mr. Otto Limborg took it at "Hatseiga" (P. Z. S. 1878, 828). Signor L. Fea found it in the "Karen Hills in November." Mr. H. J. Elwes records "many examples from Tavoy and the Hills" (J. A. S. Beng. 1887, 421).

Of our illustrations on Plate 336, figs. 1, 1a, b, c, are from male and female Sikkim specimens; fig. 2, the larva and pupa from Kanara, copied from Messrs. Davidson and Aitken's published figures, and fig. 2, a, b, from a Kanara male.

**DOLESCHALLIA ANDAMANICA** (Plate 335, fig. 2, 2a, b, c, ♂ ♀).

*Doleschallia Pratipa*, Moore, P. Z. S. 1877, p. 584, *nec* Felder.

*Doleschallia Polibete*, de Nicéville, Butt. of India, etc., ii. pl. 23, fig. 103, ♂, *nec* Cramer.

IMAGO.—Male and female. Upperside rich deep brownish-ochreous. *Forewing*

with the oblique subapical band pale ochreous, and the upper-discal area narrowly very slightly paler than the ground-colour. The subapical band is entire in both sexes, its outer lower portion not being disconnected, but extends above and below the lower radial, its lower end being quadrate and excavated on both its inner and outer sides; the black oblique band is comparatively broader than in Sikkim or Burmese specimen of *D. indica*. Underside. Male. Ground-colour rich purpurescent reddish-ochreous, clouded with rich dark yellowish, purpurescent, and greyish-ochreous, or the ground-colour is dark olive clouded with deeper olive, the normal markings being very prominent, the basal marks on both wings larger and broader than in *D. indica*, being either pure white or pale yellow, and on the hindwing there are only two submarginal prominent larger ocelli, the ordinary upper one being obsolescent. Underside of female. Ground-colour dark olive (presumably *wet* season) or uniformly brownish-ochreous (presumably *dry* season), the markings more or less indistinct, the basal marks the same as the ground-colour. Two large ocelli only, on the hindwing.

Expanse, ♂ 3 to  $3\frac{2}{10}$ , ♀ 3 to  $3\frac{4}{10}$  inches.

HABITAT.—Andamans; Kar Nicobar.

DISTRIBUTION.—Numerous specimens were taken by the late Mr. F. de Roëpstorff at Port Blair, S. Andamans. Mr. W. Doherty records it as “not common on Kar Nicobar, being probably an immigrant from the Andamans” (J. A. S. Beng. 1886, 258).

INDO-MALAYAN SPECIES.—*Doleschallia Pratipa*, Felder, Wien. Ent. Monats, iv. p. 399 (1860); Reise Nov. Lep. iii. p. 406 (1866). Butler, Trans. Linn. Soc. Zool. 1877, p. 539. Distant, Rhop. Malay. p. 88, pl. 11, fig 8, ♂; pl. 9, fig. 6, ♀ (1883). de Nicéville, J. A. S. Beng. 1895, p. 433. Hagen, Iris, 1896, p. 181, pl. 1, fig. 1, 2, *larva* and *pupa*. *Habitat*. Malay Peninsula; Sumatra.—*Doleschallia Niasica*, Butler, Annals of Nat. Hist. 1884, p. 59, ♀. *Habitat*. Nias Island.—*Doleschallia Borneensis*. Male. Upperside differs from typical Malay and Sumatran *Pratipa*, on the forewing, in the subapical fulvous band having a partly disconnected broad quadrate lower end, the black band beneath it also being broader. In the female the subapical band and the black band are also broad, the latter being entire, the bordering upper-discal pale area hardly extending to the lower median. Expanse,  $2\frac{6}{10}$  to  $2\frac{8}{10}$  inches. *Habitat*. Borneo.—*Doleschallia Bisaltide* (Pap. Bisaltide, Cramer, Pap. Exot. ii. pl. 102, fig. C, D (1779). *Habitat*. Java.—*Doleschallia Polibete* (Pap. Polibete, Cramer, *id.* iii. pl. 234, fig. D, E), Distant, Ent. Mo. Mag. 1885, p. 41. *Habitat*. Amboina; Waigiu; Batchian.—*Doleschallia Semperi* (D. Polibete, Semper, Reis. Phil. Lep. p. 115, pl. 22, figs. 1 to 10, ♂ ♀. D. Bisaltide, Semper, Verh. Z. B. Ges. Wien, 1867, p. 698, *larva*, *Habitat*. Mindanao; Luzon.

Genus KALLIMA.

*Kallima*, Doubleday, Gen. D. Lep. plate 52 (1849); Westwood, *id.* p. 324 (1850). Felder, Neues Lep. p. 14 (1861). Moore, Lep. of Ceylon, i. p. 36 (1881). Distant, Rhop. Malay. p. 429 (1886). de Nicéville, Butt. of India, etc., ii. p. 257 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 128 (1887). Kirby, Allens Nat. Hist. Butt, i. p. 105 (1894).  
*Callima*, Herr. Schæffer, Lep. Exot. ii. p. 54 (1858).

IMAGO.—Wings large, very broad and short; apex of forewing in male acutely pointed, in female produced to a lengthened point. Male. *Forewing* triangular; costa much arched and slightly excavated at the base; apex produced to an acute point; exterior margin long and convexly-angulated hindward, almost even; posterior margin long, slightly recurved, the angle obtuse; costal vein extending to three-fifths of the margin; first and second subcostal branches emitted before end of the cell, third branch at about one-fourth beyond the cell and extending to apex, fourth and fifth at three-fourths and ending below the apex; cell short, very broad; upper discocellular extremely short and outwardly oblique; middle discocellular rather short, inwardly-oblique and slightly concave; lower discocellular also inwardly-oblique and slightly curved, the radials from their angles; median veinlets very wide apart, upper median arched from its base, middle median emitted immediately before lower end of cell; submedian recurved. *Hindwing* triangular, lengthened hindward and produced into a narrow tail at end of submedian vein; anterior margin broadly lobate at the base, apex obtuse; exterior margin obliquely-convex, almost even; abdominal margin very long and excavated hindward from end of internal vein to tip of tail; precostal vein straight and strongly bifid near its end; costal vein well arched and extending to the apex; upper and lower discocellular outwardly-oblique and curved; cell closed; middle median veinlet emitted immediately before lower end of cell; abdominal area densely hairy. *Body* very robust; head and thorax densely clothed with lax scaly hairs; base of abdomen clothed with long woolly hairs; tip of abdomen compactly scaled; palpi large, porrect, pointed at apex, flattened beneath, densely scaly; forelegs of *male* slender, tibiæ and tarsi densely but compactly clothed with moderately short hairs; forelegs of *female* long, slender, scaly, dilated at the tip, the inside of which is rounded off and armed beneath with four pairs of short spines indicating the joints at the extremity, the terminal joint being minute and simple; antennæ with a gradually-formed slender club; eyes naked, large.

EGG.—[Inachus.] “Not particularly large; round; ribbed vertically.”

LARVA.—Adult. “Head armed with two long branched-spines. Segments covered with rather long hairs; armed with eleven rows of branched-spines.”

PUPA.—“Simple. Thorax slightly keeled; abdomen with small dorsal conical points.” (From G. C. Dudgeon’s Note.)

TYPE.—*K. Paralekta*.

DISTRIBUTION OF GENUS.—The species of this genus occur in India, where they are met with all along the Himalayas, from Kashmir on the West to Bhotan on the East, in Assam, Naga and Khasia Hills, Silhet, Cachar, Orissa, Hills of Central India, the Eastern Ghâts as far South as the Godavery, the Western Ghâts, and South India; also Ceylon, the Andamans, and in Burma; Tenasserim; Malay Peninsula; Sumatra; Java; Borneo; S. and W. China.

SEASONAL FORMS.—In our descriptions and figures of the species of this genus we have assigned, as *seasonal forms*, several which have hitherto been considered distinct.

According to the observations of Messrs. J. Davidson and E. H. Aitken (Journ. Bombay N. H. Soc. 1896, 256) “the *wet* and *dry* season forms of *K. Horsfieldi*, are as different as *Junonia Asterie* and *Almana*. The wet-season form is small, dark green above, and faintly ocellated on the underside, with the apex of forewing scarcely produced at all; the dry-season form is large, pale on the upperside, very variable on the underside, but without a trace of ocellation, and has the apex produced into a point which is sometimes quite a quarter of an inch in length; the hyaline marks may be present in either form.”

HABITS, AND PROTECTIVE MIMICRY.—“They are not as a rule found at any great elevation, and seem confined to the lower valleys in the different mountain and hill ranges; they frequent rocky nullahs where there is shade, and are strong on the wing and rapid in their movements. When at rest they are extremely difficult to detect—owing to their wings being usually closed over the back when in repose, not expanded, and each fore and hindwing together form the exact representation of a leaf, of which the point at the apex of the forewing forms the tip, and a long tail at the anal angle of the hindwing represents the stalk; the latter when the butterfly is in repose frequently rests against the stem on which the butterfly has settled, and produces the impression that the leaf is actually growing out of it; from the tail to the apex a more or less prominent rib-like mark extends, answering to the mid-rib of a leaf, and on either side branching veins extend more or less distinctly marked—and the first indication of their presence is generally the flash of brilliant blue and yellow as they rise with a rapid dart, startled by any movement near their resting-place, and exposing the brightly-coloured upper surface of the wings. They do not as a rule fly far, but the rapidity with which they alight again and the concealment with which their colours provide them with when settled, render them rather difficult to capture. In Sikkim *K. Inachis* is an extremely common butterfly, often settling on the banks of streams to suck up the moisture, also on the trunks of certain trees, which, I presume, furnish them with a juice of which they are fond” (L. de Nicéville, *l.c.* 258). “When frightened, it invariably

settles, as far as I have noticed, with closed wings on a twig or branch. It sometimes, as Mr. Elwes points out (P. Z. S. 1888, 366), settles with open wings, but on these occasions it has, I feel sure, no thought of enemies. It is particularly fond of the juice from the bark of certain trees, and eagerly sips up the 'sugar' of moth collectors. Stale beer, also old beer casks, are an irresistible attraction to these butterflies" (*id.* Sikkim Gaz. 1894, 146). Capt. A. M. Lang says *K. Hügelii* "has a very rapid, irregular pitching flight, now high over the tree tops, then low. It is fond of the shelter of large trees, near the roots of which it suddenly pitches, and when settled you may hunt long to see it, however carefully you have watched it settle, so perfectly does it resemble a dead leaf" (Ent. Monthly Mag. 1864, 181).

Mr. A. R. Wallace writes:—"By far the most singular and most perfect disguise I have ever met with in a Lepidopterous insect is that of a common Indian butterfly, *Kallima Inachis*, and its Malayan ally (*K. Buetoni*). I had the satisfaction of observing the habits of the latter in Sumatra, where it is rather plentiful at the end of the dry season. It is a large and showy insect when on the wing, the upper surface being glossed with blue and purple, and the forewings crossed obliquely by a broad band of rich orange. The under surface of the wings is totally different, and is seen at a glance to resemble a dead leaf. The hindwings terminate in a little tail, which forms the stalk of the leaf, and from this to the apex is a slightly curved dark brown line representing the midrib. The transverse striæ which cross the discoidal cell in many butterflies are here continued so as to form lateral veins, and the usual submarginal striæ on the hindwings, slightly modified, represent others towards the base of the wing. But it is only when the habits of the insect are observed that the disguise becomes manifest in all its perfection. This butterfly, like many others, has the habit of resting upon a nearly vertical twig or branch, with the wings closed together so as completely to conceal the upper surface. In this position, the little tail of the hindwings exactly touches the branch, and we now see why it is always curved inwards a little; for if it were quite straight, it would hang clear of the branch, and thus fail to represent an attached leaf. There is a little scallop or hollow on the margin of the forewings at the base, which serves to conceal the head of the butterfly, which is very small for its size, and the long antennæ are carried back and hidden between the folded wings. When sitting on a twig in the manner described, the insect is to all appearance a perfectly dry leaf,—yet it is evident that its chances of escape would be much increased if it were surrounded by real dry leaves instead of by green ones; for if, when pursued, it took shelter in a growing bush, it could hardly fail to be still a conspicuous object. Marvellous to relate, it does possess the habit of almost invariably entering a bush loaded with dead leaves, and is so instantly lost to sight, owing to its close resemblance to all the surrounding objects, that I doubt if the most vigilant fly-catcher

could detect it. I have myself often been utterly puzzled. I have watched it settle, apparently in a very conspicuous situation, a few yards off, but on crawling carefully up to the spot have been quite unable to detect any living thing. Sometimes, while gazing intently, a butterfly would start out from just before my eyes, and again enter another dead bush a few yards off, again to be lost in the same manner. Once or twice only was I able to detect it sitting, and admire the wonderful disguise which a most strange combination of colour, form, and habits enabled it instantaneously to assume. But there is yet another peculiarity which adds to the concealment of this species. Scarcely two of the specimens are alike in colour on the underside, but vary through all the shades of pale buff, yellow, brown, and deep rusty-orange which dried leaves assume; others are speckled over with little black dots like mildewed leaves, or have clusters of spots or irregular blotches, like the minute fungi that attack dead leaves; so that a dozen of these insects might settle on a perfectly bare spray, and clothe it at once with withered foliage not distinguishable from that of the surrounding branches" (Science Gossip, 1867, p. 195).

#### KALLIMA HÜGELII.

*Dry-season form* (Plate 337, fig. 1, 1a, ♂; 1b, c, ♀).

*Paphia Hügelii*, Kollar, in Hügel's Kaschmir, iv. pt. 2, p. 432, pl. 9, fig. ♂ ♀ (1844).

*Kallima Hügelii*, Moore, Trans. Ent. Soc. (1879), p. 12. de Nicéville, Butt. of India, etc., ii. p. 261 (1886).

*Paphia Paralekta*, Westwood, in Royle's Himalayan Botany, pl. 10, fig. 3, a, b, ♂ (1839).

*Callima Inachis*, Herr. Schæffer, Exot. Schmett. p. 77, fig. 7, 8, ♂ (1852).

IMAGO.—Male and female. Apex of forewing prolonged, longest in the female. Male. Upperside. Basal areas pale greyish-blue, the outer border of wing posteriorly, and of the hindwing broadly fulvescent bluish-grey, or olivescence-grey; submarginal sinuous line black, prominent. *Forewing* with the apex violet-black and bearing a small opaque-white dentate subapical spot; costal border broadly black-speckled; crossed by a broad outwardly-oblique discal fulvous band, extending from the costa to outer margin, where it is sullied and more or less minutely speckled with minute dark brown strigæ; outer edge of the band waved, inner edge sinuous and broadly black bordered from the subcostal to below the middle median, where it joins a black-bordered small hyaline oval spot. *Hindwing* with the apex and outer border more or less speckled with minute dark brown strigæ, and traversed by an outer-discal series of three or four black-speckled somewhat ocellate obscure patches. Underside. Ground-colour either greyish-ochreous, of uniform tint throughout or with slightly darker olivescence-ochreous ordinary inner oblique

upper and outwardly-oblique lower fasciæ, and more or less distinct olive-brown rib-line, and sometimes blotched with fungoid patches of black and olive-brown scales, or the ground-colour is pale olivescient ochreous-brown, blotched with pale ochreous patches speckled with black scales. *Body* and palpi above pale greyish-blue, beneath and legs pale greyish-ochreous; antennæ black above, tip reddish-ochreous, shaft beneath whitish-ochreous.

Female. Upperside as in male, the basal areas and outer borders paler. Underside as in male; the ground-colour either paler greyish-ochreous or pale olivescient-ochreous, with or without fungoid patches.

Expanse, ♂ 4, ♀  $4\frac{1}{10}$  inches.

*Wet-season form* (Plate 337, fig. 1, d, e, ♂).

*Kallima Boisduvali*, Moore, Trans. Ent. Soc. (1879), p. 12.

Male and female. Smaller than in *dry-season* form. Apex of forewing blunt-pointed. Male. Upperside with the fulvous band narrower, its inner-edge more broadly black bordered and the hyaline spot somewhat smaller and narrower, the subapical white spot also smaller; the basal areas of both wings much darker blue; the outer borders also darker and of a dusky fulvescent-brown. Underside ochreous-brown or vioscent ochreous-brown, numerous covered with dark brown speckles and strigæ; rib-line prominent, dark olive-brown with pale inner edge; ordinary inwardly-oblique basal and the outer fasciæ and submarginal sinuous line more or less prominent; the discal obscurely-defined ocelli on hindwing with black central dot.

Female. Upper and underside as in the male, but somewhat paler.

Expanse, ♂  $3\frac{1}{10}$ , ♀  $3\frac{6}{10}$  inches.

HABITAT.—Western Himalayas; Kashmir.

DISTRIBUTION AND HABITS.—“This is the common form of the genus occurring in the Western Himalayas, and distinguished from the Eastern form (*K. Inachis*) by its much paler blue coloration on the upperside” (de Nicéville, *l.c.* 261). Capt. A. M. Lang says “it appears only on the plainswards spurs of the Himalaya. I have taken this butterfly at Kasauli and Subhatoo, two military stations between Simla and the Plains, but no further into the mountains” (MS. Notes). “It has a very rapid, irregular pitching flight, now high over the tree tops—then low. It is fond of the shelter of large trees, near the roots of which it suddenly pitches, and when settled you may hunt long to see it, however carefully you have watched it settle, so perfectly does it resemble a dead leaf” (*id.* Ent. Mo. Mag. 1864, 181). The Rev. J. H. Hocking, in his “Butterflies of the Kangra District,” states that it is “single brooded in July. Flies about till the cold weather in November, and then hibernates, and comes out again in April. Taken at sugar in April” (P. Z. S. 1882,

239). Major H. B. Hellard obtained it in "Kashmir and Masuri, September and October" (MS. Notes). Mr. W. Doherty took it in the "River Valleys, Kumaon, 2000 to 5000 feet" (J. As. S. Beng. 1886, 121). "Very common in the low valleys of the Western Himalayas, and in the Dehra Dhun, in August and September" (P. W. Machinnon, J. As. S. Beng. 1898, 377). We possess specimens of the dry and wet season form from the Western Himalayas, Kashmir, and Kasauli. Mr. P. Crowley has a dry-season female from Raneket, Kumaon.

### KALLIMA BUCKLEYI.

*Dry-season form* (Plate 338, fig. 1, 1a, ♂; 1b, c, ♀).

*Kallima Buckleyi*, Moore, Trans. Ent. Soc. (1879), p. 11.

IMAGO.—Male. Upperside. *Forewing* with a somewhat shorter, broader, and darker fulvous band than in *K. Hügelii* or *Inachus*, its inner sinuous-edge slenderly black-bordered, the discal black spot small and blind, or, if the hyaline centre is present, it is only visible as a minute white dot; subapical spot also small; basal area uniformly dark greyish steel-blue; submarginal sinuous line very obscure. *Hindwing* uniformly dark greyish steel-blue, minutely black speckled; submarginal sinuous line slender, not prominent. Underside. Ground-colour more or less pale or dusky purpurescent-brown, the ordinary inner and outer fasciæ darker; very sparsely, or numerous, speckled with black scales; the discal ocelli on hindwing more or less obsolescent.

Female. Upperside. With similar broad fulvous band as in male, its inner sinuous-edge slenderly black-bordered, and the discal white spot small and very slender; the subapical spot larger; the basal area and the hindwing paler greyish-blue. Underside with the ground-colour either bright reddish-brown, darker ordinary fasciæ, or pale greyish-ochreous with pale olivescient-brown fasciæ, the ocelli more or less obsolescent.

Expanse, ♂  $4\frac{2}{10}$ , ♀  $4\frac{2}{10}$  to  $4\frac{4}{10}$  inches.

*Wet-season form* (Plate 339, fig. 1, 1a, ♂; 1b, c, d, ♀).

*Kallima Huttoni*, Moore, Trans. Ent. Soc. (1879), p. 12.

*Kallima Atkinsoni*, Moore, *id.* p. 10, ♀.

Male and female. Smaller than *dry-season* form. Apex of forewing bluntly-pointed; fulvous band comparatively broader than in wet-season form of *Hügelii*, the discal black spot small, either blind, or with a minute slender white dot; subapical white spot small; basal area and hindwing dusky vinous-blue. Underside. Ground-colour deep reddish-brown, with purplish-grey ordinary fasciæ, obscure



ocelli, and prominent pale edged rib-line; or deep brownish-ochreous with darker fasciæ, and obscure greyish ocelli.

Expanse, ♂  $3\frac{4}{10}$  to  $3\frac{6}{10}$ , ♀  $3\frac{6}{10}$  to 4 inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—We possess the type specimens of both sexes of the dry-season form (*Buckleyi*), from the Himalayas, taken by the late Col. F. Buckley and Capt. T. Hutton, and also of the wet-season form (*Huttoni*), from Masuri, from the same collections.

Of our illustrations of this species on Plate 338, figs. 1, 1a, b, c, are from the male and female types of *Buckleyi*—the dry-season form; and those on Plate 339, figs. 1, 1a, b, c, from the male and female types of *Huttoni*—the wet-season form; and fig. 1, d, from the type of *Atkinsoni*.

### KALLIMA INACHUS.

*Dry-season form* (Plate 340, fig. 1, 1a, ♂; 1b, c, ♀).

*Paphia Inachus*, Boisduval, in Crochard's Edit. Cuv. Rég. Anim. Ins. ii, pl. 139, fig. 3, ♀ (1836).

*Kallima Inachis*, Moore, Trans. Ent. Soc. 1879, p. 11. de Nicéville, Butt. of India, etc., ii p. 261 (1886).

IMAGO.—Male. Upperside; basal areas dark bright glossy violet-blue; apex of forewing acutely pointed. *Forewing* with the apical area violet-blue-black; a broad outwardly-oblique discal fulvous band extending from the costa to outer margin, where it is thickly speckled with dark brown short strigæ, its outer-edge somewhat waved, its inner-edge sinuous and black bordered from the subcostal to below the middle median, where it is contiguous to a black-bordered large oval hyaline white spot; outer margin traversed by a submarginal sinuous black line; a small white dentate subapical spot. *Hindwing* with the outer area somewhat fulvescent and thickly speckled with minute dark violet-brown strigæ, traversed by a submarginal sinuous black line, and an outer-discal curved series of more or less indistinct darker ocelloid patches centred with a black dot, placed in the interspaces from the subcostal to lower median veinlet. Underside. Ground-colour various shades of virescent ochreous-brown, brownish-ochreous, or virescent greyish-brown, more or less sparsely speckled with black scales; a transverse discal pale edged olive-brown rib-line extending from apex of forewing to the tail on hindwing; hyaline spot, and the discal normal ocelloid spots on hindwing partly ringed with yellowish-ochreous and black scales; submarginal line olive-brown, less sinuous on the hindwing; basal and outer oblique normal diffused-fasciæ, or lines, olive-brown. *Body* and palpi above virescent-blue, beneath and legs pale ochreous-brown.

Female. Apex of forewing prolonged. Upperside similar to male, except that the basal areas are paler violet-blue. *Forewing* with the discal hyaline spot larger; the inner edge of fulvous band less black bordered. *Hindwing* with the discal series of patches more distinct. Underside. Ground-colour paler shades of ochreous-brown, virescent or olivaceous greyish-brown than in male, similarly speckled, markings also similar; sometimes both wings are blotched with olive-brown and black-scaled fungoid patches.

Expanse, ♂ 4 to  $4\frac{2}{10}$ , ♀  $4\frac{4}{10}$  inches.

*Wet-season form* (Plate 341, fig. 1, 1a, ♂; 1b, c, ♀).

*Kallima Ramsayi*, Moore, Trans. Ent. Soc. 1879, p. 12.

Male and female. Smaller than *dry-season* form; forewing in both sexes sharp pointed. Male. Upperside with very dark and prominent markings; the sinuous inner edge of fulvous band deeply black bordered, the hyaline spot large, the submarginal sinuous line very prominent. Female somewhat paler blue, the outer border of hindwing also paler. Underside. Various shades of chestnut-brown, brownish-ochreous, or greyish brownish-ochreous, sparsely black speckled; the rib-line prominent, and sometimes with ochreous blotches or blackish fungoid patches.

Expanse, ♂  $3\frac{4}{10}$  to  $3\frac{6}{10}$ , ♀  $3\frac{8}{10}$  to 4 inches.

LARVA.—Adult. "Velvety-black covered with rather long yellowish hair. Head armed with two long branched-spines; segments armed with eleven rows of branched-spines. All the spines reddish."

PUPA.—"Simple. Thorax slightly keeled; abdomen with small dorsal conical points. Colour pale brownish-buff variegated with slaty irrorations." (From G. C. Dudgeon's Note.)

HABITAT.—Eastern Himalayas; Nepal; Sikkim, Bhotan; Upper Assam; Naga and Khasia Hills; Orissa; Eastern Ghâts; Pachmarhi Hills.

DISTRIBUTION, HABITS, ETC.—This species is restricted to the Eastern Himalayas and other localities as above given. We have verified specimens from each—excepting those recorded from Assam, Orissa, and the E. Ghâts. Mr. H. J. Elwes states that "it is common in Sikkim up to about 5000 feet elevation, from March to November," and says "this insect has been specially noticed by Wallace and later writers as an instance of protective resemblance to dead leaves, and this is, no doubt, very striking when settled with the wings closed; but this is not the universal habit of the butterfly, which I have sometimes seen settled on a branch with the wings open, when it is a very conspicuous object" (Tr. Ent. Soc. 1888, 366). Mr. L. de Nicéville also records it as "common in Sikkim at low elevations," and states that

“when frightened it invariably settles, as far as I have noticed, with closed wings on a twig or branch. It sometimes, as Elwes points out, settles with open wings, but on these occasions it has, I feel sure, no thought of enemies. It is particularly fond of the juice from the bark of certain trees, and eagerly sips up the sugar of moth collectors. Stale beer, also old beer casks, are an irresistible attraction to these butterflies. Mr. G. C. Dudgeon has bred the larva, in Bhotan, on a common blue-flowered plant named *Strobilanthes capitatus*” (Sikkim Gaz. 1894, 146). Col. C. Swinhoe has received numerous specimens from the Khasias, and refers to them as being “identical with the Burmese form, *K. Limborgii*” (Tr. Ent. Soc. 1893, 289). In Orissa, according to Mr. W. C. Taylor, “it is common in the Mals at Khurda” (List, p. 6, 1888). A female is in Col. Swinhoe’s collection from Pachmarhi, Central Provinces, taken in August by Mr. J. A. Betham, who states that it is “found fairly common down in the Khuds and ravines about this Sanatorium” (Journ. Bombay N. H. S. 1890, 284). Mr. de Nicéville records it as having been taken by Mr. W. Doherty on the Eastern Ghâts north of the Godavery” (Butt. India, ii. 261).

LIFE HISTORY.—“August 22nd, 1894:—Saw seven ova laid, in the Bhutan Hills at 1800 feet elevation, on the leaves of different plants of *Girardinia heterophylla*, *Polygonum orientalis*, and *Strobilanthes capitatus*. Eggs not particularly large for so large a butterfly; colour dark green, round, ribbed vertically with creamy-yellow. August 27th to 29th.—*Larvæ* emerged. Head black and shining; body dark brown, shiny, with two dorsal and two lateral rows of warts, each wart bearing a stiff black hair, the anterior warts bearing three hairs. These are real hairs, not spines, as appears clearly under a microscope; head not hairy. Larvæ grow very fast at this stage, and feed on the *Strobilanthes capitatus*. August 31st.—*First moult*. Verticillate spines now appear instead of hairs; also two long spines on the head, which did not exist in the first stage. Colour shiny-black. Larva almost exactly resembles that of *Pareba vesta*, for which doubtless they have been taken, thereby remaining undiscovered until now. September 3rd.—*Second moult*. Spines on second segment very short and small; both subdorsal series of spines yellowish-buff at the base; a dorsal row of spines from the fifth segment, shorter than the subdorsal ones, not yellowish-buff at the base; two last segments with a transparent appearance. September 8th.—*Third moult*. Same as second. Spines long, and eleven in number; bases of subdorsal spines orange-yellow; the second out of line; dorsal and two lateral rows of spines long, two small spines just above the legs on each side. When the skin is just shed, the spines are very short, and the larva combs them out with its mandibles and anterior legs. The long spines on the head are truncated, and grow in much the same way as do a butterfly’s wings when just emerged from the pupa. At first they are hardly apparent, but

gradually they become first bumps, then short thick protuberances, until they are finally fully developed. September 13th.—*Fourth and last moult.* Larva velvety-black (the orange spots having disappeared), covered with rather long yellowish hair. All the spines reddish. General appearance that of a *Lasiocampa* or *Gastropacha* larva. September 22nd.—Three larvæ hung up for pupal change. Four pupated on the 23rd. Pupal stage lasts about ten days" (G. C. Dudgeon, Journ. Bombay Nat. Hist. Soc. ix. 342 (1895).

Of our illustrations of this species, Plate 340, figs. 1, 1a, b, c, represent the male and female *dry-season* form, from Sikkim examples, and Plate 341, figs. 1, 1a, b, c, the types of *Ramsayi*, the *wet-season* form, from Nepal.

### KALLIMA LIMBORGII.

*Kallima Limborgii*, Moore, Proc. Zool. Soc. 1878, p. 828; Trans. Ent. Soc. 1879, p. 10. de Nicéville, Butt. of India, etc., ii. p. 262 (1886).

*Wet-season form* (Plate 342, fig. 1, 1a, ♂ ♀).

Male and female. Upperside of a deeper and more uniform steel-blue than in *Inachus*, virescent tinted in some lights. *Forewing* with the fulvous band brighter, its inner sinuous edge more diffusely black-bordered; the discal hyaline spot small and almost circular. Underside either pale brownish-ochreous, fulvescent or purpurescent-ochreous, with darker olivescence-brown or brown ordinary fasciæ; sparsely black speckled, and sometimes blotched with black and grey scaled fungoid patches, or the ground-colour is more uniformly olivescence-grey or pale reddish-ochreous, with slightly darker fasciæ; and more or less distinct rib-line.

Expanse, ♂ 4, ♀  $4\frac{4}{10}$  inches.

*Dry-season form* (Plate 342, fig. 1, b, c, ♂ ♀).

Male. Upperside paler blue, and more virescent-tinted than in wet-season, the fulvous band paler. Female. Upperside paler than in male, the basal areas of a greyer blue tint, and sometimes with a virescent flush, the fulvous band also paler, and the hyaline spot larger. Underside. Various shades of yellowish or pale ochreous-brown, with darker brown fasciæ, sparsely speckled with darker scales, and a prominent rib-line; or more uniformly pale purpurescent-ochreous, with pale olivescence-brown fasciæ, darker rib-line, and sometimes blotched with fungoid patches.

Expanse, ♂  $3\frac{8}{10}$ , ♀  $3\frac{8}{10}$  to  $4\frac{4}{10}$  inches.

HABITAT.—Burma ; Upper Tenasserim.

DISTRIBUTION.—Col. C. H. E. Adamson records it as being found frequent in forests throughout Burma. He possesses examples from Akyab, taken in April ; Chindwin Valley, July ; Bhamo, February ; and Shweegoon, near Moulmein, August. Mr. P. Crowley, from Looshai and Tenasserim. We have type specimens from Meetan and Taoo, Upper Tenasserim. Capt. C. T. Bingham took it in the Thoungyeen Valley in February and October. Mr. F. C. Godman has it from E. Pegu, taken in March and April by Mr. W. Doherty, and from Bankasoon, taken by Mr. A. O. Hume. Mr. Leonardo Fea took it on Mount Karen, 1000 feet, in April, on the Karen Hills in November, and at Palone in August. Mr. W. Doherty records it from the “Karen Hills and Ruby-mines Districts” (P. Z. S. 1891, 283). Capt. E. Y. Watson obtained “a single male in the Chin Hills 3500 feet, in the rainy season” (J. Bombay N.H.S. 1897, 656) ; “Poungadaw, Upper Burma ; Beeling, Upper Tenasserim” (*id.* 1886, 6) ; “Pauk, October ; Tilin, November” (*id.* 1891, 41). Dr. N. Manders records it as “a common species in the Shan States, in the later rainy months” (Tr. Ent. Soc. 1890, 525).

# KALLIMA PHILARCHUS.

*Dry-season form* (Plate 343, fig. 1, 1a, ♂ ; 1b, c, ♀).

*Amathusia Philarchus*, Westwood, Cabinet of Oriental Entom. p. 56, pl. 27, fig. 4, ♂ (1848).

*Kallima Philarchus*, Moore, Trans. Ent. Soc. 1879, p. 15 ; *Lep. of Ceylon*, i. p. 37, pl. 20, fig. 1, ♂ (1881). de Nicéville, Butt. of India, etc., ii. p. 265 (1886).

IMAGO.—Male. Upperside indigo-blue, sometimes changing to a greenish tint ; cilia grey. *Forewing* with the apical area blue-black, containing a small opaque-white subapical spot ; an oblique transverse discal broad pale blue somewhat curved band, its outer edge sinuous and posteriorly crossed by a submarginal sinuous blackish line, its inner edge marked by a black discocellular streak and an outer lower broken streak extending to or beyond the lower median ; sometimes a minute hyaline discal spot is present between the middle and lower median veinlets ; two ill-defined dark streaks are also visible within the upper end of the cell. *Hindwing* with the apical area tinged with dusky-brown ; a submarginal bluish-black sinuous line and a less-defined lower marginal line ; a series of two or three outer-discal obscurely-defined ocellate spots also apparent. Underside either purpurescent ochreous-brown or brownish-ochreous, with darker fasciæ and speckles, prominent rib-line, and obscure discal ocelli, or the ground-colour is vinaceous-grey with pale olive-brown fasciæ, outer-discal obscure ocelli, and less defined rib-line, or sometimes the ground-colour is more uniformly olivescence-grey.

Female. Upperside similar to but paler than in male, the basal areas of a greenish tint, the band on forewing whitish. Underside pale olivescence-ochreous,

with obscure darker olivescient-brown fasciæ, dark rib-line, discal spots and speckles, and sometimes with blackish-speckled fungoid basal patches. *Body* and palpi above blue, beneath and legs pale ochreous; antennæ black above, tip and beneath reddish-ochreous.

Expanse, ♂ 3 to 4, ♀  $4\frac{2}{10}$  inches.

*Wet-season form* (Plate 344, fig. 1, 1a, ♂; 1b, c, ♀).

*Kallima Mackwoodi*, Moore, Trans. Ent. Soc. 1879, p. 14; Lep. of Ceylon, i. p. 37, pl. 20, fig. 2, 2a ♂ ♀ (1881). de Nicéville, Butt. of India, etc., ii. p. 266 (1886).

Male. Upperside similar to the *dry-season* form. *Forewing* with a prominent large oval hyaline spot between the lower medians, and a smaller spot also in the upper median interspace. Underside. Ground-colour either olivescient-ochreous, black-speckled, and with indistinctly-defined darker oblique purpurescent fasciæ and prominent brown rib-line, or violaceous-grey with olivescient-fasciæ, or uniformly reddish-ochreous, black speckled, and very prominent olive-brown rib-line. *Forewing* with the two hyaline spots as on the upperside. *Hindwing* with outer-discal more or less obscure ocelli.

Female. Upperside similar to the male, but paler; the basal areas of a greenish tint; the band on forewing whitish; hyaline spots the same. Underside pale reddish-ochreous with darker fasciæ, black speckles, and pale-edged olive-brown rib-line. *Forewing* with hyaline spots as above. *Hindwing* with obscure pale ochreous ocelli.

Expanse, ♂  $3\frac{4}{10}$  to  $3\frac{8}{10}$ , ♀  $3\frac{8}{10}$  to  $4\frac{2}{10}$  inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Occurs in the "medium range principally and upwards. Always found in the jungle. Most plentiful in the Ambigamoa District" (F. M. Mackwood, MS. Notes). "A very rare butterfly; taken at Kandy" (Capt. Wade). Col. J. W. Yerbury obtained numerous specimens at Peripacherakullum, on the Kandy road to Trincomalie, in October, 1890.

### KALLIMA HORSFIELDII.

*Dry-season form* (Plate 345, fig. 1, 1a, ♂; 1b, c, ♀).

*Paphia Horsfieldii*, Kollar, in Hügel's Kaschmir, iv. pt. 2, p. 434, pl. 10, ♀ (1844).

*Kallima Horsfieldii*, Moore, Trans. Ent. Soc. 1879, p. 13. de Nicéville, Butt. of India, etc., ii. p. 265 (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 227; *id.* 1896, p. 256, pl. 2, fig. 5, 5a, larva and pupa.

IMAGO.—Upperside similar to *K. Philarchus*. Distinguished by having the blue-band on forewing comparatively narrower posteriorly, its inner black streaks

being more linearly disposed, its outer edge less irregularly-curved across the wing, thus somewhat widening the black outer-border more broadly hindward towards the posterior angle, and consequently giving the blue band a straighter appearance; the blue colour of the band is also somewhat darker; the hyaline spots either absent, or when present, very small. Underside. Ground-colour either pale purpurescent-ochreous with slightly darker fasciæ, pale edged olive rib-line, basal black-speckled fungoid patches, and discal ocelloid spots, or the ground-colour is uniformly pale purpurescent-grey, with slightly-defined pale olivescient fasciæ, prominent olive-brown rib-line, and obscure discal ocelloid spots.

Female. Upperside much paler than in male; the band on forewing as in male, but also much paler, and its inner black streaks similarly linearly disposed, thus giving it a straighter appearance than in *K. Markwoodi*. Underside pale yellowish-ochreous, with slightly darker olivescient yellowish-ochreous fasciæ, olive brown rib-line, and obscure discal ocelloid spots, or the ground-colour is more uniformly dull pale greyish-ochreous, with prominent olive-brown rib-line.

Expanse, ♂ 3 to  $3\frac{4}{10}$ , ♀  $3\frac{4}{10}$  to  $4\frac{2}{10}$  inches.

*Wet-season form* (Plate 346, fig. 1, 1a, larva and pupa; 1b, c, ♂ ♀).

*Kallima Wardi*, Moore, Trans. Ent. Soc. 1879, p. 14, ♂. de Nicéville, Butt. of India, etc., ii. p. 266, pl. 23, fig. 104, ♀ (1886).

*Kallima Doubledayi*, Moore, Tr. Ent. Soc. 1879, p. 14, ♂ ♀.

Male. Upperside similar to the *dry-season* form; the blue band on forewing of the same shape and dark tint of blue, the two oval hyaline spots distinct. Underside rich purpurescent reddish-brown or dark ochreous-brown, black-speckled, with greyish-bordered darker fasciæ, prominent pale-edged rib-line, and obscurely-defined discal ocelli, the upper centred by the hyaline spots.

Female. Upperside similar to male; the blue band paler, its inner black streaks more prominent and continued to the subcostal; hyaline spots prominent. Underside rich brownish-ochreous, with grey-bordered darker fasciæ, prominent grey-edged olive-brown rib-line, grey points to submarginal sinuous line, and distinct grey-ringed discal ocelloid spots.

Expanse, ♂ 3 to  $3\frac{8}{10}$ , ♀  $3\frac{8}{10}$  to 4 inches.

LARVA.—“Cylindrical, finely pubescent; segments golden-brown, armed with nine longitudinal rows of red branched-spines; head black, surmounted with two long straight black horns set with minute spines; legs blackish. Feeds on Karvi (*Strobilanthes*)” (Davidson and Aitken, *l.c.* 1890, 277).

PUPA.—Large; golden-brown; dorsum arched, with a dorsal and lateral series of broad segmental points; thorax arched and broadly angulate posteriorly; head-piece cleft, and pointed in front.

HABITAT.—Western Ghâts ; Bombay ; S. India.

DISTRIBUTION, HABITS, ETC.—Kollar states that Hugel's specimens of *Horsfieldii* were from the Himalayas. This is, doubtless, an erroneous locality ; "Scind Hills," given as the locality of *K. Doubledayi*, is also very doubtful. All the specimens we have examined are from the Southern Hills. It has been taken on the Matheran Hill, near Bombay, by Mr. Newton, and by Dr. J. D. Smith. Col. C. Swinhoe obtained it at "Poona in August, and on the Khandalla Ghâts in August, being a very difficult insect to capture, as it keeps to the tops of the trees on the slopes of the Hills" (P. Z. S. 1885, 129). Dr. A. Leith took it at Belgaum. Mr. P. Crowley has a male of the dry-season form from Karwar, another from Khandalla taken in October, and a female of wet-season form also from Karwar, also a male from N. Kanara, taken by Mr. Wise in July. We possess dry-season male and female from Koonoor, Nilgiris, and Travancore, and wet-season male also from the Nilgiris. Mr. E. H. Aitken says, "I believe this butterfly is fairly common in every well-wooded part of the N. Kanara District. It appears chiefly in March, April, and May, when dead leaves are about, and haunts dry nullahs and ravines, flashing into sight suddenly and as rapidly disappearing into a tree, where, after long and cautious peering you (fail to) discover it sitting motionless on the trunk, inaccessible to your net. When you do catch one it is broken. I suppose their habit of settling in the interior of a tree, upon the trunk or lower branches, tends to break their wings. According to the Rev. A. B. Watson, of Poona, this, and several other butterflies, which most successfully defy the net, may be captured wholesale at 'sugar.' He had sugared some trees for moths without success, but passing afterwards by daylight, he found that they had become the rendezvous for half a dozen species of butterflies, of which he took as many as he pleased, the present species, in particular, being so infatuated or so drunk that it allowed itself to be taken with the fingers" (Journ. Bombay N. H. S. 1886, 132). "We found one larva of this butterfly in July on Karvi (*Strobilanthes*), and after careful examination, discovering nothing except its colour to distinguish it from *Hypolimnas bolina*, decided that it must be a larva of the large form of that butterfly. The likeness of the pupa to that of *bolina* was still more exact, and the emergence of a beautiful Kallima took us completely by surprise" (J. Davidson and E. H. Aitken, *id.* l.c. 1890, 277). "We have only one species of Kallima in the N. Kanara District. It is a very variable butterfly, and the *wet* and *dry-season* forms are as different as *Junonia Asterie* and *Almana*. The *wet* form is small, dark green tinted above and fairly ocellated on the underside, with the apex of forewing scarcely produced at all. The *dry* form is large, pale on the upperside, very variable on the underside, but without a trace of ocellation, and has the apex produced into a point which is sometimes quite a quarter of an inch in length ; the hyaline marks may be present in either form. The butterfly is very



common, specially during July and August, among Karvi (*Strobilanthes*), on which the larva feeds, but is more difficult to catch than most butterflies, owing to the swiftness of its flight and its habits of always resting on the trunk of a tree, head downwards, in situations in which a net is not easily manœuvred. No butterfly, however, is more easily seduced with liquor. It flies in the day, but keeps out of the sun" (*id.* l.c. 1896, 256).

Mr. G. F. Hampson obtained it in the "Nilgiris, from 2000 to 4000 feet elevation, being rare on the Northern, not uncommon on the Southern Slopes. Comes freely to sugar" (J. As. Soc. Beng. 1888, 356). Mr. H. S. Ferguson records it as "not uncommon in Travancore" (Journ. Bombay N. H. S. 1891, 9).

Of our illustrations of this species on Plate 345, fig. 1, 1a, b, c, represent the male and female *dry-season* form (*Horsfieldii*), and on Plate 346, figs. 1, 1a, the larvæ and pupæ, fig. 1 being copied from Davidson and Aitken's published figure, and fig. 1a from an original drawing received from the same authors.

#### KALLIMA ALOMPRA.

*Kallima Alompra*, Moore, Trans. Ent. Soc. 1879, p. 14, ♂ ♀. de Nicéville, Butt. of India, etc., ii. p. 265 (1886).

Male. Similar to dry-season form of *K. Horsfieldii*. Upperside. Forewing with the blue band of somewhat darker tint; discal spots minute. Underside greenish-brown, or pale purpurescent-grey, with slightly darker olivescient fasciæ, prominent olive rib-line, and obscure ochreous-ringed discal ocelli.

Female. Upperside paler than in male; the band on forewing also paler and bluish-white; discal spots minute. Underside ochreous, black speckled, with grey-bordered darker olivescient-ochreous oblique fasciæ, pale-edged olive rib-line and obscure discal ocelli.

Expanse, ♂  $3\frac{6}{10}$ , ♀ 4 inches.

HABITAT.—Burma.

NOTE.—The only examples of this species known to us are the type specimen in our own possession, and the male and female in the Hewitsonian collection. Each is labelled "Burma," but from what district, we, as yet, know not. From the description above, it will be seen that it is totally distinct from *K. Knyveti*.

#### KALLIMA KNYVETTI (Plate 347, fig. 1, 1a, ♂).

*Kallima Knyveti*, de Nicéville, Butt. of India, etc., ii. p. 267 (1886). Elwes, Proc. Zool. Soc. 1891, p. 283. Smith and Kirby, Rhop. Exot. pt. 22, Kall. pl. 1, fig. 3, 4, ♂ (1892).

IMAGO.—Male. Upperside. Forewing with the apical half deep indigo-blue.

black, the basal area dark obscure bluish-green; the oblique discal band broad and violaceous bluish-white, its course straight—not curved as in other species,—its edges uneven and with diffused darker blue; a moderate-sized oval hyaline spot between the middle and lower medians; the discocellular veinlet defined by a slender line of the basal ground-colour, but there are no dark linear markings in front of it, as are present in the other species; a submarginal acutely-sinuuous black line extending from the middle median to posterior margin; a small opaque-white subapical spot. *Hindwing* dark bluish-green, the apical area ochraceous and brown speckled; a submarginal sinuous black line, and the outer-discal ordinary series of ocelloid spots obscure; the cell area and broadly below it towards the tail, including the abdominal margin, thickly clothed with fine hairs. Underside. Ground-colour dark purpurescent or olivescient ochreous-brown, with darker olive-brown speckles, rib-line, oblique fasciæ, and submarginal line, or the ground-colour is reddish-ochreous with darker fasciæ and other markings.

Expanse, ♂  $3\frac{8}{10}$  to  $4\frac{2}{10}$  inches.

HABITAT.—Bhotan; Naga Hills; Burma.

DISTRIBUTION.—The type specimens were “obtained by Mr. A. V. Knyvett in the forest beyond Buxa, Bhotan, in August” (de Nicéville, l.c. 267). We have examined males from Bhotan in the collection of Mr. F. Godman and of Mr. H. Grose-Smith; males from the Naga Hills taken in August by Mr. W. Doherty in Mr. P. Crowley’s collection, and a male from the Daunat Range, Burma, taken in March, in Mr. Grose-Smith’s possession. Mr. W. Doherty found it in the “Naga Hills, 5500 to 7000 feet, from June to September.” Mr. L. de Nicéville records a “single male obtained in the Daunat Range, Upper Tenasserim, in March, 1895, by Mr. T. A. Hauxwell” (J. Bombay N. H. S. 1899, p. 334).

#### **KALLIMA ALBOFASCIATA** (Plate 347, fig. 2, 2a, ♀).

*Kallima albofasciata*, Moore, Proc. Zool. Soc. 1877, p. 584; Trans. Ent. Soc. 1879, p. 13. de Nicéville, Butt. of India, etc., ii. p. 263 (1886).

IMAGO.—Male and female. Upperside glossy greyish indigo-blue; cilia grey. *Forewing* with the apical area blue-black and with a small opaque bluish-white subapical spot, which in the female is somewhat larger and divided by the fourth subcostal veinlet and has a white dot below it; an oblique medial-discal cream-white band, its outer edge waved, its inner edge sinuous and black bordered; a discal oval hyaline black-bordered spot; outer border traversed by a blue-black sinuous submarginal line. *Hindwing* with the anterior margin pale lilacine-ochreous and brown speckled; a submarginal blue-black sinuous line. Underside. Male. Ground-colour

either pale purpurescent greyish-ochreous, olivescient-ochreous, or purpurescent brownish-ochreous, with slightly darker ordinary fasciæ, more or less prominent pale-edged olive rib-line, obscure discal ocelloid spots, and sometimes mottled with blackish speckles or with basal blackish-speckled fungoid patches. Female more or less olivescient yellowish-ochreous, sparsely black-speckled, slightly darker fasciæ, obscure discal ocelloid spots, and pale-edged olive-grey or brown rib-line.

Expanse, ♂  $3\frac{2}{10}$  to  $3\frac{4}{10}$ , ♀  $3\frac{6}{10}$  to  $3\frac{8}{10}$  inches.

HABITAT.—South Andamans.

DISTRIBUTION.—Numerous examples of this species were taken by the late Mr. F. de Roëpstorff at Port Blair, S. Andamans.

INDO-MALAYAN SPECIES.—*Kallima Buxtoni*, Moore, Trans. Ent. Soc. 1879, p. 10. Distant, Rhop. Malay. p. 429, pl. 37, fig. 2, ♂ (1886). de Nicéville, Journ. As. Soc. Beng. 1895, p. 432. *Syn.* K. amplirufa, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 192. *Habitat.* Malay Peninsula; Sumatra; Nias; Borneo.—*Kallima Spiridira*, Grose-Smith, in Forbes' Nat. Wanderings, p. 274 (1885). de Nicéville, J. As. Soc. Beng. 1895, p. 432. *Syn.* K. Spiridion, Grose-Smith and Kirby, Rhop. Exot. *Kall.* pl. 1, fig. 1, 2, ♂ (1892). *Habitat.* Sumatra.—*Kallima Paralekta* (Paphia Paralekta, Horsfield, Catal. Lep. Mus. E. I. Company, pl. 6, fig. 4, ♂ (1829). Doubleday and Hewitson, Gen. D. Lep. pl. 52, fig. 3, ♀ (1849). Moore, Tr. Ent. Soc. 1879, p. 9, ♂ ♀. *Syn.* K. Hewitsoni, Moore, *l.c.* p. 9, ♀. *Habitat.* Java.—*Kallima Chinensis*, Swinhoe, Ann. Nat. Hist. 1893, p. 255. *Habitat.* W. China.—*Kallima Eucerca*, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 191. *Habitat.* Liukiu, Island of Okinawa.

## GROUP VI. ARGYNNINA.

*Dryades*, Hübner, Tentamen Lep. p. 1. (1806); Verz. bek. Schmett. p. 29 (1816).

*Argynnites*, Blanchard, Hist. Nat. des Ins. ii. p. 331 (1845).

*Argynnidæ* (part), Duponchel, Catal. Méth. Lep. Eur. p. 2 (1844). Guénee, Faun. Lep. E. et L. p. 17 (1867).

*Argynnidi*, Stephens, Catal. Brit. Lep. B. M. p. 13 (1850). Stainton, Manual Brit. Lep. i. p. 21 (1857). Scudder, Butt. U. S. i. p. 502 (1889). Tutt, Brit. Butt. p. 271 (1896).

*Argynnides* (part), Kirby, Eur. Butt. p. 21 (1862). Butler, Catal. Fabr. Lep. B. M. p. 100 (1869).

*Argynnidæ*, Newman, Brit. Butt. p. 21 (1871).

*Argynninae*, Doherty, Journ. As. Soc. Bengal, 1886, p. 109.

*Argynnina*, Moore, Lep. Indica, ii. p. 227 (1895).

*Nymphalina* (part), Herr. Schæff. Prod. Syst. Lep. p. 17 (1864). Distant, Rhop. Malayana, p. 83 (1882).

*Nymphalidæ* (part), Lang, Rhop. Eur. p. 159 (1884).

*Nymphalinae* (part), de Nicéville, Butt. of India, ii. p. 1 (1886).

*Nymphalidæ* (*Argynnis Group*), Schätz, Exot. Schmett. ii. p. 112 (1887).

*Cynthiae*, Doherty, Journ. As. Soc. Bengal, 1816, p. 109.

## CHARACTERS OF THE GROUP ARGYNNINA.

IMAGO.—*Forewings* elongately triangular, or triangular; apex obtuse or rounded; exterior margin more or less slightly scalloped, or even. *Hindwings* short, broad, obovate, in some subquadrate; exterior margin more or less slightly or prominently scalloped, in some with a more or less prominent broad caudate angle at end of the upper median veinlet.

LARVA.—Head hairy, either armed with two vertical branched-spines, or, not armed. Body armed with from six to nine longitudinal rows of branched-spines.

PUCHA.—More or less constricted at the waist; thorax arched; wing-cases ample and prominent; either with dorsal conical tubercles, which, in some are slender, in others the anterior and the posterior dorsal pair are abnormally long, enlarged and broadly expanded at the base; head very obtusely or more or less acutely bifid.

EGG.—“Sugar-loaf shaped” (Scudder). “As high as wide or higher; ribs rather numerous, heavy, blunt, anastomosing, projecting at apex, with numerous distinct cross lines” (Doherty).

## Genus CETHOSIA.

*Cethosia*, Fabricius, Illiger's Mag. vi. p. 280 (1807). Latreille, Consid. Gen. p. 440 (1810).

Doubleday, Gen. D. Lep. i. p. 150 (1848). Crotch, Cist. Ent. i. p. 65 (1872). Moore, Lep. of Ceylon, i. p. 51 (1881). Distant, Rhop. Malayana, p. 170 (1882). Semper, Reisen Phil. Lep. p. 100 (1881). de Nicéville, Butt. of India, ii. p. 31 (1886).

*Alazonia*, Hübner, Verz. bek. Schmett. p. 46 (1816).

*Eugramma*, Billberg, Enum. Ins. p. 78 (1820).

IMAGO.—Male. *Forewing* subtriangular; costa arched, apex convex, exterior margin oblique, sinuous; costal vein extending to two-thirds the margin; first subcostal branch emitted immediately before end of the cell, second branch at one-fourth beyond the end, third branch at one-half, fourth and fifth at nearly two-thirds beyond the cell; upper discocellular extremely short, bent inward contiguous to subcostal, second discocellular deeply concave and inwardly-oblique, lower discocellular long and slightly concave; cell broad, truncate at the end; two upper median veinlets from lower end of the cell, the upper being much arched from the base, lower median at more than one-third before its end; submedian vein recurved. *Hindwing* short and broad; exterior margin convex, deeply sinuous; costal vein extending to the apex; precostal spur curved outward and emitted at some distance beyond base of subcostal; first subcostal branch emitted at one-fourth before end of the cell; discocellulars curved obliquely outward, lower very slender, radial from their middle; two upper median branches from lower end of cell, lower median from opposite base of second subcostal; submedian vein straight, internal vein recurved at its base. *Body* moderately stout; palpi ascending, finely pilose, second

joint projecting one-third above the head; third joint short, pointed; forelegs of male slender, nearly cylindric; femur and tibia of about equal length, scaly above, very slightly hairy beneath; forelegs of female smoothly-scaled, femur slightly hairy beneath, tarsus dilated beneath and rounded at tip, apical spines slender and acute.

TYPE.—C. Cydippe.

LARVA.—[Mahratta.] “Cylindrical; constricted between each pair of segments, and tapering towards the head. Segments armed with six longitudinal rows of fine, pointed spines; on the head with one pair of longer, blunt spines.”

PUPA.—“Suspended vertically; slender, with two large foliaceous processes springing from middle of the back, and many less prominent processes and tubercles on the head, thorax, and abdomen.”

FOOD-PLANT AND HABITS OF LARVA.—“Feeds on the wild Passion flower (*Modecca palmata*), and is gregarious all through its life” (Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, 270).

NOTE.—Mr. de Nicéville remarks, “Where these butterflies occur they are usually numerous in individuals, and very conspicuous from their bright coloration. Owing to the strong scent with which their bodies are impregnated, they are probably distasteful to insectivorous animals” (Butt. India, ii. 33).

**CETHOSIA CYANE** (Plate 348, fig. 1, 1a, ♂; 1b, c, d, e, ♀).

*Papilio Cyane*, Drury, Illust. Exot. Ent. i. pl. 4, fig. 1, ♀ (1770). Fabricius, Syst. Ent. p. 503 (1775).  
Donovan, Ins. Ind. pl. 35, fig. 2 (1800).

*Cethosia Cyane*, Kollar, Hügel's Kaschmir, pt. 4, p. 443 (1844). Doubleday and Hewits. Gen. D. Lep. p. 150 (1850). Butler, Catal. Fabr. Lep. B. M. p. 100 (1869). de Nicéville, Butt. of India, etc., ii. p. 33 (1886).

IMAGO.—Male. Upperside. *Forewing* with the basal area from lower half-length of cell and across the disc obliquely to near posterior angle, rich fulvous-red; the outer area of the wing from base of costa to posterior angle, bluish-black; crossed by an upper-discal outwardly-oblique irregular-edged, bluish-white band, bearing two black spots in the lower medial and upper median interspaces; above the band are two superposed subapical more or less ill-defined slender incomplete lanceolate white marks, pointing inwards, the lower one being slightly coalescent with that portion of the discal band; followed by a submarginal series of more or less distinct small white spots, the upper two or three rounded the others lunate and longer, the two medial being coalescent or merged into that portion of the discal band, the two lowest slender and fulvous-red; beyond is a marginal series of well-defined slender deeply-angled marks, one in each interspace except the lowest,

where there are two forming a **W**-shaped mark ; medially within the lower-discal area are three superposed small black spots, and within the upper area of the cell the black and fulvous colour is divided into more or less distinct and irregular cross-bars. *Hindwing* rich fulvous-red, with a broad outer-marginal black band, two inwardly-oblique subcostal angular black bars, three black discal spots outside the cell, an outer-discal series of round black spots, and a submarginal diffused series of continuous black lunules partly coalescing with the marginal band, above which is a slender fulvous-white costal lunule, and on the marginal black band is a series of well-defined slender inwardly-pointed deeply-angled white marks ; cilia white. Underside. Both wings with the ground-colour of basal area rich deep red, the medial discal area traversed by a fulvous sinuous band, but which, on the forewing is present only from the lower median to posterior margin, and a similar coloured narrow fascia inwardly bordering a broad black outer marginal band, on which latter is a series of sharply-defined slender inwardly-pointed deeply-angled white marks, each of which latter is centred by a white streak extending inward from the cilia. *Forewing* also with the upper-discal oblique white band, the area above and below being black, as above, with the two upper and also three similar lower slightly-defined slender lanceolate marks, followed by a submarginal series of sinuous slender marks ; base of costa with two black dots ; cell area crossed by black bars, interspaced with red, and violaceous bars ; the lower basal area with an inner black spot, four superposed medial discal spots and a similar row of less-defined outer contiguous smaller spots, the interspace between the two series being violaceous-white ; sometimes a small black loop-mark is present between the basal spot and lower discal pair. *Hindwing* also with the basal area crossed by five interrupted series of black bars, followed by a dentate spot near end of cell ; the extreme basal and the medial interspaces being violaceous-white, and the subbasal and outer space deep red ; bordering the red area is a similar discal series of black marks, the upper one of which is an angular bar and the lower irregular-shaped spots ; followed by a broad discal whitish band outwardly-edged by a series of very small black spots, and beyond by an outer-discal whitish band traversed by an inner row of black spots, and an outer row of small lunular spots in pairs between each interspace. *Thorax* blackish, clothed with olivescient-fulvous hairs ; abdomen above fulvous, beneath black spotted ; front of head black, streaked with white ; palpi above olive-brown, tip black, sides and beneath white ; femora black, sides white streaked ; tibiae and tarsi fulvous-brown ; antennæ black.

Female. Upperside either similar to male, the basal areas being paler fulvous, palest on the hindwing, with the lower-discal spots on forewing mostly obsolete, and those on the hindwing less prominent, or the *forewing* is black with an olivescient tinge, the veins basally and their borders sometimes ferruginous ; the lower basal

area greyish-white, powdered with dusky olive scales, the interspaces of black cell-bars darker olive, bluish-white upper-discal oblique band, submarginal lunular spots and marginal angled-marks as in male, but more prominent, the lower-discal black spots larger, two inner smaller spots also present before the lower pair. *Hindwing* greyish white, the costal border and outer margin black, the latter with angled-marks as in male, and an inner row of greenish-white lunules; the two inner-discal black spots and the outer-discal row of spots are larger, and between them is a parallel medial-discal row of smaller less-defined spots; sometimes also the inner-discal series is composed of five spots, one in each interspace, and also with an additional spot within the cell. Underside with the ground-colour and marginal markings greenish-white, the interspaces of cell-bars, in forewing, and of those of hindwing, darker bluish-green; oblique white band and black markings as on upperside; base of forewing and subbasal streak on hindwing more or less red.

Expanse, ♂  $3\frac{6}{10}$  to 4, ♀ 3 to  $4\frac{2}{10}$  inches.

LARVA.—Cylindrical; purplish-black, segments with alternate yellow and crimson bands. Head armed with two long spines, segments with dorsal and lateral rows of fine spines. Feeds on *Passiflora*, July. (Described from drawing by Major C. H. E. Adamson.)

HABITAT.—Masuri; Oudh; Eastern Himalayas; Assam; Cachar; Silhet; Khasias; Calcutta; Orissa; Burma; Upper Tenasserim.

DISTRIBUTION.—It is recorded from Masuri by Kollar (Hügel's *Kaschmir*, iv. 2, p. 443). Capt. A. M. Lang obtained "a single specimen in a wild jungle spot on the Gogra, in Oudh" (*Ent. Mo. Mag.* 1864, 131). "It is a common species in Sikkim, Assam, and the Khasia Hills. I have taken a single female in Calcutta in the cold weather. Mr. Wood-Mason took it in Cachar. It has also been taken in Sibsagar, Upper Assam; it also occurs in Silhet, Manipur, Arakan, Pegu, and Upper Tenasserim" (de Nicéville, *l.c.* 34). Mr. W. C. Taylor found it "very rare in Khorda, Orissa, in October" (*List* p. 4). Capt. M. J. Slater found the larva feeding on the Passion flower, the larva being yellow, black, and crimson, in alternate bars, and covered with stinging spines. Pupa hung by tail, and in leaf-like appendages, resembled that of *Pap. Pammon*" (*MS. Notes*, 302). Mr. L. de Nicéville records it as "common in Sikkim from April to December, at 5000 feet elevation and below. The larva of this species and those of *C. Biblis* and *Cynthia Erola* feed in such numbers on the common white Passion flower as to become a veritable nuisance" (*Sikkim Gazetteer*, 1895, 133). Col. C. H. E. Adamson records it as "common in Burma up to about 1000 feet elevation during the rainy season. I have bred it from larva feeding on the Passion flower, in Moulmein, in July, the perfect insect emerging in August" (*List* 1897, p. 17). Signor L. Fea obtained it at Bhamo.

**CETHOSIA NIKOBARICA** (Plate 349, fig. 1, 1a, b, c, ♂ ♀).

*Cethosia Nikobarica*, Felder, Verh. Z. B. Gesells. Wien. xii. p. 484 (1862); *id.* Reisen Novara, Lep. iii. p. 384, pl. 48, fig. 7, 8, ♂ (1867). Moore, Proc. Zool. Soc. Lond. 1877, p. 583. de Nicéville, Butt. of India, etc., ii. p. 37 (1886).

IMAGO.—Male. Upperside. *Forewing* with the basal area rich deep fulvous-red, the streaks crossing the cell, and the apical half fulvescent-black, the latter bearing a slight bluish flush; beyond the cell is a series of bluish-white streaks from the subcostal to upper median, the two lowest being very small, less defined, and inwardly disposed, followed by a medial upper-discal series of bluish-white marks, the upper three being very slender and acutely angled, with the point inward, the fourth placed between upper and middle medians, large, and obliquely quadrate, the lowest small and curved or sometimes ringed; beyond is a submarginal row of very small white spots, the lower three being lunular and the last red, followed by a marginal row of very ill-defined slender pale dentate lunules; below the cell is a subbasal black excurved streak, and two discal similar streaks. *Hindwing* rich deep fulvous-red; with a broad fulvescent-black outer marginal band, inwardly bearing a row of red lunules, which are either entirely enclosed within the band or are partly broken up by the black edge, and then the inner edge of the band is bordered by a series of black lunules; a marginal row of very ill-defined slender pale dentate lunules is also sometimes apparent; a subbasal upper series of slightly-defined slender black sinuous marks, a more prominent black discal upper dentate mark, below which is a round spot and a slightly-defined broken sinuous line extending to above anal angle, and near the outer band is a row of more or less distinct black spots. Underside deep red; marginal borders black, bearing slender white dentate marks and central streak. *Forewing* also with black cell-bars interspaced with red and grey; a subbasal black lunule and a transverse inner-discal row of black lunular marks, which are outwardly broadly bordered by fulvous-white, followed by the outer-discal complete row of black-bordered white dentate marks and outer bordering small spots, the inner series being also black centred. *Hindwing* also with a basal, two subbasal, and a medial black sinuous line, the two former bordered and interspaced with fulvous-white, the latter bordered by a similar-coloured broader fascia, followed by an outer-discal row of black dentate spots, and a contiguous parallel row of spots in pairs between the veins, all encompassed by a white band. *Body* fulvous-red; thorax clothed with olivescient hairs; head black, and white spotted; palpi olive-brown above, white beneath; thorax beneath banded with black, abdomen slightly spotted with black; legs whitish, femora black streaked; antennæ black.

Female. Upperside olivescient-black. *Forewing* with the lower discal area and



interspaces of cell-bars olive-grey; markings as in male, but broader. *Hindwing* olivescient-grey, darkest basally; markings as in male. Underside. Ground-colour of forewing dull sullied brownish-red, of hindwing dull pale olivescient-brown; black markings and white bands as in male.

Expanse, ♂ 3 to  $3\frac{2}{10}$ , ♀  $3\frac{4}{10}$  to 4 inches.

HABITAT.—Andaman and Nicobar Isles.

DISTRIBUTION.—This species occurs commonly at Port Blair, Andamans; and has been taken at Nankowri, Kondul, and Great Nicobars in the Nicobar group of Islands.

**CETHOSIA MAHRATTA** (Plate 350, fig. 1, 1a, larva and pupa; 1, b, c, ♂ ♀).

*Cethosia Mahratta*, Moore, Proc. Zool. Soc. Lond. 1872, p. 556. de Nicéville, Butt. of India, etc., ii. p. 34, pl. 22, fig. 98, ♀ (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 270, pl. B, fig. 1, 1a, larva and pupa.

*Papilio Cyane*, Cramer, Pap. Exot. iv. pl. 295, fig. C, D, ♂ (1780). Herbst, Pap. pl. 248, fig. 3, 4 (1798). Duncan, Nat. Libr. Exot. Lep. pl. 14.

*Cethosia Cyane*, Godart, Enc. Méth. ix. p. 247. Moore, Catal. Lep. Mus. E. I. C. pl. 5, fig. 8, 8a, larva and pupa (1857).

*Alazonia Symbliblis* (part), Hübner, Verz. bek. Schmett. p. 46 (1816).

IMAGO. Male. Upperside fulvous-red; cilia white. *Forewing* with the apical half, transverse wavy streaks in the cell, and discal spots between the lower veins fulvescent-black; a subapical broad oblique white band crossed on its lower part by two black spots which form the middle pair of a transverse discal series, the two upper and lower of which are conical and slenderly edged inwardly with white; beyond these is a submarginal upper row of small white spots, and then a marginal series of slender white angled-marks. *Hindwing* with the anterior and outer margin fulvescent-black, the latter with a series of slender white angled-marks; two subbasal irregular series of small black spots, a similar inner-discal series, a medial transverse row of larger conical spots, and an outer-discal row of large oval spots, the latter series each slightly ringed with white and bordered outwardly by a black lunule. Underside deep fulvous-red basally, fulvous-yellow externally; outer margins black bordered, with clearly-defined slender white angled-marks having a central white streak pointed inward. *Forewing* also with a black cell and discocellular streaks interspaced with bluish-grey; a subapical oblique white band, inner and outer-discal series of black spots, as on upperside, the inner series interspaced with white, and the outer series edged with white and black. *Hindwing* also with a basal and two subbasal transverse rows of black streaks, two inner-discal rows and two outer-discal rows of black spots; the two subbasal and the two discal series each interspaced by a white band. *Body* fulvous-red; head blackish, and white

streaked; palpi above olive-brown, tip black, beneath white; body beneath fulvous-white, black streaked; legs fulvous, femora black streaked; antennæ black.

Female. Upperside somewhat paler fulvous, with markings as in male, but blacker and more prominent, those on the hindwing having the discal series of spots larger, the inner and medial series more or less partly confluent; the outer-discal series of oval spots more distinctly white-ringed, and the submarginal black lunules also whitish edged externally. Underside with the ground-colour paler than in male; markings similar.

Expanse, ♂  $2\frac{6}{10}$  to  $3\frac{6}{10}$ , ♀  $3\frac{8}{10}$  to  $4\frac{2}{10}$  inches.

LARVA.—“Cylindrical, but much constricted between each pair of segments, and tapering towards the head. Colour dark brown, with bright red bands encircling all the segments except the 1st, 2nd, 6th and 8th. On the 6th and 8th the red is replaced by a broader lemon-yellow band; segments armed with six longitudinal rows of fine, pointed black spines.” Head armed with two longer blunt black spines.

PUPA.—“Suspended vertically. Slender. With two large, foliaceous processes springing from middle of the back, and many less prominent processes and tubercles on the head, thorax, and abdomen. Colour purplish-brown, much mottled with lighter and darker shades; six dorsal spots of bright gold” (*Davidson and Aitken, l.c.*).

HABITAT.—South India.

DISTRIBUTION AND HABITS.—“Common along the Malabar Coast at the foot of the Ghats. The Indian Museum, Calcutta, possesses specimens from Karwar, Bombay, Calicut, Kanara, the Wynaad, and Trevandrum” (*de Nicéville, l.c.* 34). “Fairly common everywhere in wooded country, especially during the latter half of the rains” (*Davidson and Aitken, l.c.* 1896, 248). “We got the larvæ first in June and July, and then very plentifully in October, on the wild Passion flower (*Modecca palmata*); it is gregarious all through its life. The pupa, when touched, vibrates in a manner well calculated to deter the hungriest enemy” (*Ditto, l.c.* 1890, 270). The late S. N. Ward, in his MS. notes, says it is “not common, in fact rather rare on the Western Coast, and seldom to be seen on the Eastern. Larva found at Sircy, in September, feeding on the Passion flower; it is gregarious in its habits, twenty or thirty being found on one branch.” Mr. G. F. Hampson records it as being found in the “Nilgiris, 3000 to 3500 feet; common on the Western slopes, and a rare straggler throughout the rest of the District” (*Journ. As. Soc. Bengal*, 1888, 352).

Of our illustrations on Plate 350, fig. 1 is copied from Messrs. Davidson and Aitken's published figures of the larva and pupa, and fig. 1, a, from the late Mr. S. N. Ward's original drawings; fig. 1, b, c, is from a male and female.

**CETHOSIA NIETNERI** (Plate 351, fig. 1, larva and pupa, 1a, b, c, ♂ ♀).

*Cethosia Nietneri*, Felder, Reisen Novara, Lep. iii p. 380, pl. 48, fig. 5, 6, ♀ (1867). Moore, Lep. of Ceylon, i. p. 51, pl. 27, fig. 3, ♂, 3a, ♀, 3b, larva and pupa (1880). de Nicéville, Butt. of India, etc., ii. p. 35 (1886).

IMAGO.—Male. Upperside blue-black. Cilia white. *Forewing* with the lower basal area ochreous merging to bluish-white discally and along posterior border; the black cell-bars slightly interspaced with bluish-white scales; beyond the cell is a bluish-white upper-discal outwardly-oblique series of irregular-shaped streaks, followed by a discal transverse row of slender conically-lunate marks pointing inwards, a contiguous submarginal row of small lunate spots, the lower one elongated and the last angulate, followed by a marginal series of slender angled-marks, the lowest one of which is double; below the cell is a subbasal black bar; two discal bars of which the upper one is short, the lower elongate and disposed obliquely-inward; beyond the latter is a contiguous larger diffused quadrate spot, their intervening spaces, from the base, being more or less thickly speckled with black scales. *Hindwing* with the discal area bluish-white, the costal and outer border being broadly black; cell area suffused with ochreous; some ill-defined black cell-streaks; an inner-discal series of distinct small spots, a middle row of large narrow spots, and a contiguous outer-discal row of still larger oval spots, the two latter series sometimes longitudinally coalescent; beyond is a submarginal row of narrow lunules. Underside olive-grey, merging outwardly to bluish-grey; bordered by a submarginal narrow ochreous band, and a marginal sinuous black band with prominent slender white angled-marks and central streaks. *Forewing* also with black cell-bars, lower discal spots, a transverse discal series of large conical white-ringed spots, and a contiguous outer row of white-bordered lunate spots. *Hindwing* also with prominent black basal and subbasal transverse streaks, and smaller discal and outer rows of spots, as on upperside. *Thorax* above blackish, clothed with olive-brown hairs; abdomen above ochreous; head black, spotted with white; palpi above olive-brown, tip black, beneath whitish; body beneath whitish, and black streaked; legs ochreous-white, femora black streaked; antennæ black.

Female. Upperside duller blue-black; markings as in male, but of a deeper bluish-white; basal areas not ochreous. Underside as in male.

Expanse, ♂ ♀  $3\frac{1}{2}$  to 4 inches.

LARVA.—Cylindrical; purplish-black, with red transverse bands, the sixth and eighth segments with a yellow band. Head armed with two long branched-spines; the segments with two dorsal and two lateral rows of long slender finely-branched spines. Feeds on *Modecca*.

PUPA.—Brown, mottled with ochreous-white. Abdominal segments tuber-

cular; wing-cases dilated and exfoliated beneath; head-piece with two pointed processes.

HABITAT.—Ceylon.

DISTRIBUTION.—“Occurs in the lower lands, but more numerous in the Hilly Districts. Commoner some years than others” (F. M. Mackwood). “Taken at Galle and Kandy” (Capt. Wade). “Very common in the low hill country round Kandy, rarely met with at Colombo in June and July” (Dr. N. Manders, J. A. Soc. Bengal, 1899, 191).

**CETHOSIA BIBLIS** (Plate 352, fig. 1, 1a, ♂; 1b, c, d, ♀).

*Papilio Biblis*, Drury, Illust. Exot. Ent. i. pl. fig. 4, ♂ (1770). Cramer, Pap. Exot. ii. pl. 175, fig.

A, B, ♀ (1777). Herbst, Pap. pl. 248, fig. 1, 2, ♂ (1798).

*Cethosia Biblis*, Fabricius, Illiger's Mag. vi. p. 280 (1807). Westwood's Edit. Drury, Ins. i. p. 9. de Nicéville, Butt. of India, etc., ii. p. 36 (1886). Distant, Rhop. Malay. p. 446, pl. 38, fig. 3, ♂ (1886).

*Papilio Populi*, Müller, Natursystem, i. p. 608, pl. 19, fig. 4 (1774).

*Cethosia Penthesilea*, Fabricius, Spec. Ins. ii. p. 38 (*nec Cramer*).

*Alazonia Symbiblis* (part), Hübner, Verz. bek. Schmett. p. 46 (1816).

*Cethosia Biblina*, Godart, Encyc. Méth. ix. p. 248 (1819).

*Cethosia Thebava*, Grose-Smith, Annals Nat. Hist. 1887, p. 296; Rhop. Exot. i. *Ceth.* pl. fig. 3, 4, ♂ (1889)—*Aberration*.

IMAGO.—Male. Upperside. Ground-colour of both wings rich fulvous-red; the apical half of forewing and the outer margin of hindwing fulvescent-white. Cilia white. *Forewing* also with the cell crossed by two pairs of slender black wavy bars and a similar pair bordering the black discocellular; a lower medial-discal series of ill-defined slender black linear marks, and a similar subbasal curved mark; three slender small white subcostal oblique streaks beyond the cell, and sometimes two smaller lower spots are also present; a transverse outer-discal series of five white slender angled-marks pointing inwards, followed by a parallel row of white somewhat reniform spots, and a marginal series of white slender angled-marks. *Hindwing* also with the basal bars of the underside slightly visible; two ill-defined costal waved blackish streaks, an inner-discal spot and sinuous line; beyond is an outer-discal row of more distinct small black spots, and then a submarginal row of lunules, which latter are each sometimes broken in two; a marginal series of slender white angled-marks. Underside. Ground-colour deep fulvous-red basally, fulvous-yellow externally; outer margin with slender black-edged white angled-marks and central streak. *Forewing* also with prominent black cell-bars, two transverse inner-discal series of slender spots, outer-discal slender oval spots and contiguous pairs of small spots; the cell-bars being interspaced and narrowly edged with bluish-grey,

ochreous sinuous line, followed by an outer-discal dusky fascia, and two ocellate spots, the upper one placed between the subcostal and discoidal veinlet, the lower one between the middle and lower medians, a much smaller ocellus is slightly apparent above the anal angle; beyond are two black sinuous marginal lines. Underside paler ochreous-yellow, basal areas more or less reddish; markings narrower than in the upperside, the apical spots on forewing white; the outer area of hindwing partly suffused with violaceous-grey; the ocelli distinct.

Female. Upperside rich dark bluish-grey, brightest and paler on the hindwing; outer borders ochreous-brown. *Forewing* with black cell-streaks; a bluish-white transverse discal sinuous band formed by broad black-edged lunules traversed exteriorly by a black sinuous line, beyond which is an outer-discal row of black diffused spots, and then two submarginal sinuous lines. *Hindwing* with a short dull bluish-white upper discal black-edged sinuous band confined to the costal and subcostal interspaces, its inner black line obsolescent hindward; two ocelli, as in male, larger and prominent, their inner ring being olive; a much smaller similar ocellus also near anal angle; submarginal sinuous lines black. Underside. Ground-colour pale dull olivescient yellowish-ochreous; markings as in male; the discal area sullied white; ocelli prominent.

Expanse, ♂  $3\frac{4}{10}$  to  $3\frac{8}{10}$ , ♀ 4 to  $4\frac{2}{10}$  inches.

LARVA.—Pale yellow, reddish-brown beneath; segments brown streaked; spiracles black; head spinous, armed with two long hindward-curved thick spinous processes; segments armed with two dorsal and two lateral rows of long slightly-branched spines, the dorsal and upper lateral row arising from a red round tumid spot.

PUPA.—Pale reddish-brown; truncated at both ends; head-piece short and thick, with two short points; thorax conically pointed at top; anterior abdominal segments subdorsally produced on each side into a broad alary expanded appendage, which is pointed hindward into a short process, and forward into a lengthened slender process; middle segments with a short subdorsal tubercle, the two anal segments with longer basally-thickened processes.

HABITAT.—Ceylon.

DISTRIBUTION.—“Found everywhere in Ceylon, both in the plains and up to 6000 feet, in forest lands, all the year; most plentiful from May to October. Flight low, very tame; a dozen at a time will alight on the ground close to you” (Capt. Hutchison). “It is locally common in the low country and the middle hill districts. It is generally found in thick jungle near water. The female is much less commonly seen than the male” (Dr. N. Manders, J. A. Soc. Bengal, 1899, 191).

INDO-MALAYAN SPECIES.—*Cynthia Erotella*, Butler, Trans. Linn. Soc. Lond.

Zool. 1877, p. 544. *Syn.* C. Cantori, Distant, Ann. Nat. Hist. 1882, p. 406; Rhop. Malay. p. 185, pl. 10, fig. 5, ♂ (1883). C. Erotoides, de Nicéville, Journ. As. Soc. Bengal, 1896, p. 403. E. Deione, Distant, Rhop. Malay. p. 184, pl. 10, fig. 1, 2, ♂ ♀. *Habitat.* Malay Peninsula; Sumatra; Borneo; Java.—*Cynthia Battaka*, Martin, Nat. Tijds. Ned. Ind. 1894, p. 338. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 403. *Habitat.* N.E. Sumatra.—*Cynthia Orakilia*, Kheil, Rhop. Nias, p. 21, pl. 2, fig. 9, ♂ (1884). Weymer, Stett. Ent. Zeit. 1885, p. 262, *id.* 1887, p. 5, pl. 2, fig. 3, ♀. *Habitat.* Nias Island.—*Cynthia rotundata*, Obërthur, Etudes Entom. 1893, p. 10. *Habitat.* Tonkin.—*Cynthia Hainana*, Holland, Trans. Amer. Entom. Soc. 1887, p. 116. *Habitat.* Hainan.—*Cynthia Deione*, Erichson, Nova Acta Acad. Nat. Cur. xvi. Suppl. i. p. 279, pl. 50, fig. 2, 2a (1833). Semper, Reis. Phil. Lep. p. 105, pl. A, fig. 5, larva; pl. 19, fig. 7, 8, ♂. *Habitat.* Philippines.

### Genus TERINOS.

*Terinos*, Boisduval, Spéc. Gen. Lep. pl. 9, fig. 4 (1836). Doubleday, Gen. D. Lep. i. p. 159 (1848). Wallace, Trans. Ent. Soc. Lond. 1869, p. 340. Distant, Rhop. Malayana, p. 181 (1882). Semper, Reis. Phil. Lep. p. 103 (1888). de Nicéville, Butt. of India, ii. p. 37 (1886).

IMAGO.—Male. *Forewing* triangular; costa much arched, apex somewhat truncate, exterior margin rounded below the apex, thence concave and slightly emarginate, posterior angle very obtuse, posterior margin slightly recurved; costal vein extending to nearly half the margin; cell short, broad, closed; first subcostal branch emitted at a short distance before end of the cell, second branch at its end, third at about two-fifths beyond, fourth at half and ending at the apex; discocellulars inwardly-oblique, upper extremely short, almost obsolete, middle discocellular incurved, lower discocellular long and very obliquely incurved; two upper median veinlets emitted beyond lower end of the cell. On the upperside is a prominent *velvety patch of raised scales occupying the lower discal area* broadly from above the lower radial to the posterior and outer margins. *Hindwing* almost quadrate; costal margin very slightly curved; exterior margin convex anteriorly, slightly sinuous, and produced into a broad angle at end of upper median veinlet; precostal vein slightly bent outward; cell closed; radial starting from lower subcostal at some distance beyond its base; discocellular incurved, slender; two upper medians emitted at some distance beyond lower end of cell. On the upperside is a *prominent broad apical velvety patch of raised scales*, extending to below the second subcostal branch. *Body* moderately stout; thorax hairy; palpi porrect, ascending, first and second joints laxly scaled, slightly hairy above and at the side, second joint long, subcylindric, apical joint slender, fusiform, pointed; forelegs of male

slender, hairy; forelegs of female scaly, femur hairy beneath, tarsus slender, spines slender; antennæ slender, with a short obtuse club; eyes hairy.

TYPE.—T. Clarissa.

LARVA and PUPA.—Unknown.

**TERINOS CLARISSA** (Plate 359, fig. 1, 1a, ♂).

*Terinos Clarissa*, Boisduval, Spéc. Gen. Lep. i. pl. 9, fig. 4 (1836). de Nicéville, Butt. of India, ii. p. 39, pl. 23, fig. 101, ♂ (1886).

IMAGO.—Male. Upperside rich dark purplish violaceous-brown. *Forewing* with a broad darker brown *velvety patch of raised scales* occupying the lower discal area obliquely from the second discoidal veinlet to posterior margin. *Hindwing* with a similar but smaller apical *velvety patch of raised scales*, the lower outer margin of the wing being broadly ochreous and bearing two series of dark purple-brown lunules, the outer series being slender and more or less obsolescent. Underside dull ferruginous-brown, marked with seven or eight rather indistinct glossy violet-blue transverse irregular sinuous lines. *Forewing* also with the outer-discal line lunularly bordered with dull ochreous, and having a prominent subapical pale violet oval spot. *Hindwing* also with outer blue lines lunularly bordered with ochreous, and having a medial discal series of five round rich brown spots bordered with ochreous, the false end of the cell marked by a bluish-white bar.

Female. Upperside paler purplish violaceous-brown. *Forewing* crossed by four darker violaceous diffused sinuous discal fasciæ, each being angulated near upper end, the submarginal fascia slightly bordered posteriorly by pale obscure ochreous lunules. *Hindwing* with the lower outer margin broadly ochreous, traversed by a broader inner series of dark brown lunules than in male, and slender outer lunular line. Underside brighter ferruginous than in male, with similar transverse irregular sinuous pale violet-blue lines. *Hindwing* with similar medial discal series of dark spots.

Expanse, ♂  $3\frac{2}{10}$ , ♀  $3\frac{4}{10}$  inches.

HABITAT.—Upper Tenasserim; Malay Peninsula; Singapore; Borneo; Java.

DISTRIBUTION.—“A single male, as described and figured by Mr. de Nicéville (*l.c.*), was taken by Capt. C. T. Bingham at Popee, Thoungyeen, Upper Tenasserim, in September. Mr. A. R. Wallace records it from Singapore. A male, labelled Siam, and a female Java from Java, is in the British Museum Collection. The type was described from a Java specimen.

Of our illustrations of this species on Plate 359, figs. 1, 1a, are from a Bornean example of the male.

INDO-MALAYAN SPECIES.—*Terinos Ludmilla*, Staudinger, MS. Coll. Brit. Mus.

*Habitat.* Great Sangir Island.—*Terinos Lucilla*, Butler, Trans. Ent. Soc. Lond. 1870, p. 489; Lep. Exotica, p. 152, pl. 54, fig. 3 (1873). Semper, Reis. Phil. Lep. p. 104, pl. 19, fig. 5, 6, ♂ ♀ (1888). *Habitat.* Philippines.—*Terinos Lucia*, Staudinger, Deuts. Ent. Zeit. 1889, p. 45. *Habitat.* Luzon.—*Terinos fulminans*, Butler, Cistula Entom. i. p. 9 (1869); Lep. Exotica, p. 151, pl. 54, fig. 2 (1873). *Syn.* T. Phalaris, Weymer, Stell. Ent. Zeit. 1887, p. 3, pl. 2, fig. 1, ♂. *Habitat.* Sarawak, Borneo.—*Terinos Terpander*, Hewitson, Proc. Zool. Soc. Lond. 1862, p. 90. *Syn.* T. Clarissa; Doubleday, Gen. D. Lep. pl. 21, fig. 3. *Syn.* T. Nympha. Wallace, Tr. Ent. Soc. Lond. 1869, p. 342. *Habitat.* Sumatra.—*Terinos Atlita* (Pap. Atlita, Fabr. Mant. Ins. ii. p. 37 (1787). T. Atlita, Butler, Catal. Fabr. Lep. B. M. p. 117, pl. 1, fig. 3 (1870). *Habitat.* Sumatra.—*Terinos Teuthras*, Hewitson, Proc. Zool. Soc. Lond. 1862, p. 89. Distant, Rhop. Malay. p. 183, pl. 10, fig. 6, ♂ (1882). *Syn.* Terinos Viola, Wallace, Trans. Ent. Soc. Lond. 1869, p. 343. *Habitat.* Malay Peninsula; Penang; Singapore.—*Terinos Teos*, de Nicéville, Journ. Bombay Nat. Hist. 1893, p. 41, pl. K, fig. 5, 6. *Habitat.* Sumatra.—*Terinos Militum*, Obérthur, Bull. Soc. Ent. France, 1897, p. 175. *Habitat.* Tonkin.—*Terinos Robertsi*, Butler, Ann. Nat. Hist. 1867, p. 399, pl. 8, fig. 2, 3, 4. Distant, Rhop. Malay. p. 182, pl. 10, fig. 7, ♂ (1882). *Habitat.* Malay Peninsula; Penang.

#### Genus ATELLA.

*Atella*, Doubleday, Gen. Diurnal Lep. i. p. 165 (1848). Moore, Lep. of Ceylon, i. p. 61 (1881). Distant, Rhop. Malayana, p. 173 (1882). de Nicéville, Butt. of India, ii. p. 28 (1886). Leech, Butt. of China, i. p. 207.  
*Phalanta*, Horsneld, Desc. Catal. Lep. Mus. E. I. C. pl. 7, fig. 5 (1829).  
*Argyronome* (part), Hübner, Verz. p. 32 (1816).

IMAGO.—Male. *Forewing* subtriangular; costa arched, apex rounded, exterior margin oblique and slightly waved; costal vein short, stout, extending to beyond half the margin; first subcostal branch emitted immediately before end of the cell, second branch at some distance beyond the end, third branch at fully one-third beyond, fourth and fifth at about two-thirds beyond; upper discocellular very short, middle discocellular inwardly-oblique and deeply concave, lower discocellular outwardly-oblique and slightly concave, radials from their angles; middle median branch emitted immediately before lower end of the cell, lower median at nearly one-half before the end; cell broad, truncate at the end. *Hindwing* short, broad, somewhat quadrate; anterior margin almost straight, exterior margin convex, waved, slightly angular below the middle; costal vein extending to the apex; pre-costal vein curved outward and emitted at some distance above the base of subcostal; first subcostal emitted at one-third from upper end of the cell; discocellulars



of equal length, very oblique and slightly concave, radial from their middle; two upper median branches from lower end of the cell, lower median from opposite second subcostal; submedian vein straight, internal vein recurved. *Body* moderately stout; palpi ascending; second joint long, projecting above the head, tumid, scaly and hairy; third joint very slender, and finely pointed, scaly; forelegs slender, of male hairy; forelegs of female scaly and slightly hairy, tarsal joints apical, spined; antennæ with a spatular club; eyes naked.

TYPE.—*A. Phalantha*.

LARVA.—“Cylindrical; moderately thick, very smooth, with an oily gloss; segments armed with six longitudinal rows of sharp branched-spines; head unarmed.

PUPA.—“Suspended by the tail, but in a horizontal position; with a subdorsal series of five acutely-pointed tubercles, between each pair another pair of very small blunt tubercles” (Davidson and Aitken, *l.c.*).

**ATELLA PHALANTHA** (Plate 360, fig. 1, *larva* and *pupa*; fig. 1, a, b, c, ♂ ♀ (*Wet-season*); fig. 1, d, e, f, ♂ ♀ (*Dry-season*)).

*Papilio Phalantha*, Drury, *Illust. Exot. Ent.* i. pl. 21, fig. 1, 2 (1770). Fabricius, *Ent. Syst.* iii. i. p. 149 (1793).

*Argynnis Phalantu*, Godart, *Encyc. Méth.* ix. p. 259 (1819).

*Atella Phalanta*, Doubleday, *Gen. D. Lep.* p. 167 (1851). Moore, *Catal. Lep. Mus. E. I. C.* i. p. 151, pl. 5, fig. 7, 7a, *larva* and *pupa* (1857); *id.* *Lep. of Ceylon*, i. p. 62, pl. 31, fig. 1, ♂, 1a, *larva* and *pupa* (1881). Distant, *Rhop. Malay.* p. 173, pl. 9, fig. 4, ♂ (1882). de Nicéville, *Butt. of India*, ii. p. 30, pl. 20, fig. 88, ♂ (1886). Davidson and Aitken, *Journ. Bombay Nat. Hist. Soc.* 1890, p. 269, *larva* and *pupa*.

*Papilio Columbina*, Cramer, *Pap.* iii. pl. 238, fig. A, B, ♀ (1779); iv. pl. 337, fig. D, E, ♂ (1781).

*Argyronome Columbina*, Hübner, *Verz. bek. Schmett.* p. 32 (1816).

*Phalantu Columbina*, Horsfield, *Desc. Catal. Lep. E. I. C.* pl. 7, fig. 5 (1829).

*Papilio Laudonius*, Jablonsky and Herbst, ix. p. 186, pl. 256, fig. 3, 4 (1798).

*Papilio Phalantus*, *id.* pl. 256, fig. 5, 6 ♂; pl. 257, fig. 1, 2, ♀.

IMAGO.—Male and female. Upperside bright yellowish-ochreous. *Forewing* with two black short slender sinuous bars across middle of the cell, a similar darker pair at its end, followed beyond by a short broad sinuous streak from the costa to the lower radial, and is then succeeded below the cell by an inwardly-oblique series of four irregular-shaped spots, and beyond by a medial-discal transverse row of similarly-disposed narrow spots, an outer-discal row of round spots, then an inner submarginal sinuous line, confluent with an outer straight line, and a marginal row of triangular spots. *Hindwing* with a slightly-defined slender black lunule within the cell, two before its end, and two also above it; a transverse inner-discal irregular series of

slender lunules which are slightly pale bordered externally; a medial-discal row of four larger black oval spots, two submarginal sinuous slightly confluent lines, and marginal triangular spots. Underside paler, and with all the markings, as on upperside much less defined; the interspaces of cell-bars and outer markings suffused with violet-grey, and the inner-discal series outwardly bordered with greyish lunules. In some specimens, presumably dry-season, all the markings on the upper and underside are less prominent. *Body* and palpi above yellowish-ochreous; beneath and also femora beneath greyish-white; tibia and tarsi pale ochreous; antennæ ochreous-brown.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{2}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

LARVA.—“Cylindrical, moderately thick, very smooth, with an oily gloss, and bears six longitudinal rows of sharp branched-spines. Head unarmed. Colour varying from dark brown to pale yellowish-green, with a white or yellowish spot at base of each spine” (Davidson and Aitken, *l.c.*).

PUPA.—Suspended by the tail, but in a horizontal position. “Green, with a subdorsal series of five acutely pointed tubercles, marked with red, between each pair another pair of very small blunt tubercles, the upper edge of wing-covers and a spot on each side of head also marked with red” (de N. *l.c.*).

HABITAT.—India; Ceylon; Burma; Siam; Malay Peninsula; Sumatra; Java; Hong Kong; Hainan; Japan.

DISTRIBUTION AND HABITS.—“This is one of the commonest Indian butterflies, occurring throughout the year in the Plains and in suitable seasons in the Outer Himalayas up to 8000 feet” (de Nicéville, *l.c.* 31). We possess examples from Kashmir (Bayne Reed); Kasauli; Nepaul; Bombay; Malabar; Shevaroy; Ceylon; Burma; Penang; Java; and Hainan. Col. J. W. Yerbury obtained it at “Campbellpore in July, and at Abbottabad in October” (Ann. N. H. 1888, 139). Major H. B. Hellard obtained it at “Simla and Masuri, from June to October” (MS. Notes). Examples from Dugi, 12,000 feet elevation, taken in August and September by Capt. Thompson, are in Mr. J. H. Leech’s Collection. Mr. W. Doherty took it in the “Kumaon Terai and Hills up to 6000 feet” (J. A. S. Bengal, 1886, 121). Capt. H. Chaumette found it “plentiful at Saugor and in Oudh. Larva reared at Lucknow on the esculent *Flacourtia sapida* in September, changing to pupa on the 5th, the imago emerging on the 11th. It is swift on the wing, now and then keeping them motionless like an *Argynnis*. It is fond of thickets, and settles on the flowers of *Jasminum sambac*. It is common on the wing in July and August” (MS. Notes). Capt. A. M. Lang found it “tolerably common in Oudh, at Umballa, and in the Himalayas up to 8000 feet. Larva reared on *Flacourtia*. The pupæ are perfect little gems, of various colours, brilliant reflections of gold, silver, blue, green, and pink” (Ent. Mo. Mag. 1864, 131). Col. C. Swinhoe records “two specimens taken in Kurachi in July, 1882; was not observed throughout 1879-80” (P. Z. S. 1884,

505). "Took it at Poona in every month except July, August, and September, and in Bombay from July to December" (Ditto, P. Z. S. 1885, 128). "We have reared this butterfly in Guzerat, Mahableshtar, and Karwar, in March, May, June, and November. It feeds on one or more species of *Flacourtia*. The beautiful pupa is very variable, some specimens being almost white, and some bright green; the markings are usually silver-edged or tipped with red. It hangs by the tail, but in a horizontal position. It is not rare in Bombay, and is one of the commonest species on the Hills in March. The larva feeds on the young shoots, of *Flacourtia montana*, which come up from the roots. The butterfly is one of the most sprightly and characteristic species of our Hill Stations, flitting everywhere from bush to bush, and even when it settles moving its wings for ever in the restless way peculiar to it" (Aitken and Davidson, Journ. Bombay N. H. S. 1886, 130, *id.* 1890, 269). "Not a common species in the Sikkim Hills. It is found throughout the warm months from the level of the Terai to about 5000 feet elevation. In Sikkim, the pupa is dichroic, one form is green, red, and golden, the other is white, black, and golden, the latter is very beautiful" (de Nicéville, Sikk. Gaz. 1894, 132). "In the neighbourhood of Calcutta it is a very common insect at all seasons" (*id.* J. A. S. Bengal, 1885, 44). Mr. A. Grote reared the larva on *Flacourtia sapida*, at Allipur, near Calcutta, and from whose drawing, by native artist, our figure on Plate 360 is copied. In Ceylon it is "generally common, but chiefly in low country. At Colombo, it is plentiful in gardens during the S.W. Monsoon, and again towards the end of the year. It flies quickly and alights on bushes" (Lep. Ceylon, i. 62). In Burma it is "common all the year round, about the edge of streams. I have reared the insect from larvæ feeding on Willow" (Major C. H. E. Adamson, List 1897, 17). Dr. N. Manders found it "very common, in the Shan States, throughout the year" (Tr. Ent. Soc. 1890, 520).

#### ATELLA ALCIPPOIDES.

*Atella Alcippe*, Distant, Rhop. Malayana, p. 151, fig. ♂ (1882). de Nicéville, Butt. of India, ii. p. 31 (1886), *nec* Cramer.

*Wet-season form* (Plate 361, fig. 1, 1a, b, ♂ ♀).

IMAGO.—Male and female. Upperside bright ochreous. *Forewing* with two pairs of slender black wavy bars across the cell and a similar pair at end of cell; a black broad inner-discal irregular streak extending obliquely outward beyond the cell from the costa to upper median, followed below the cell by four short narrow streaks, the two upper placed between the medians, and the two lower in the sub-median interspace, with an outer medial streak also beyond the latter; beyond is a medial discal row of black spots, the two upper of which are either lunate and

confluent, or separate, the lower four rounded, the lowest being more or less diffused; between the inner-discal costal streak and the latter row of spots is a short black sinuous streak decreasing from the costa to near upper median; a submarginal sinuous line and the outer border black, enclosing a row of ochreous lunules, of which latter the three upper are small and obsolescent, the next more or less dentate, and the lower decreasingly linear. *Hindwing* with two slender blackish cell-bars, two at its end, an inner-discal transverse irregular sinuous line, a similar medial-discal line, followed by an outer-discal row of black rounded spots, a submarginal sinuous line, a narrower more even outer line, and black narrow outer border. Underside paler yellowish-ochreous; all the transverse markings ill-defined, except the lower discal black spots on forewing, the outer discal and marginal lines on both wings being slightly lunularly bordered by pale violaceous-grey.

Expanse, ♂  $1\frac{8}{10}$ , ♀  $2\frac{2}{10}$  inches.

*Dry-season form* (Plate 361, fig. 1, c, d, ♂).

Male and female. Upperside paler ochreous than in wet-season; the basal and discal markings all very slender and more or less obsolescent, the outer discal and marginal markings distinct. Underside paler, but similar to wet-season.

Expanse,  $1\frac{8}{10}$  to 2 inches.

HABITAT.—Sikkim; Silhet; Khasias; S. India; Burma; Tenasserim; Andamans; Malay Peninsula; Borneo.

DISTRIBUTION.—“Appears to occur in Sikkim only in the outer valleys debouching on to the Plains, such as Sivoke, from whence the natives bring it in considerable numbers. I have never seen it alive in Sikkim. It occurs almost throughout the year except in winter” (de Nicéville, Sikk. Gazetteer, 1894, 133). Col. C. Swinhoe has examples from the Khasias, and from Karwar, Bombay. “This is a very local species, in the North Kanara District, Bombay. We have met with it only at three places on the ascent of the Ghauts, from January to April. In April we found the larva on a tree, which we believe to be a local species of *Hydnocarpus*. The larva is like that of *Cirrochroa*, cylindrical, with six rows of fine branched-spines; head unarmed; colour green, with longitudinal interrupted lines of brown and claret colour on the back only; head pale yellowish with two black bars. In habits it resembles the restless and active larva of *Cirrochroa*. The pupa is almost a smaller copy of that of *A. Phalantha*” (Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, 248). Col. C. H. E. Adamson records it as “common at Tavoy, Tenasserim, and also taken at Phapoon in the autumn. It is a local insect” (List Burma Lep. 1897, 17). Dr. J. Anderson obtained it at Thaing, King Island, Mergui, in the cold weather” (Journ. Linn. Soc. Zool. 1886, 34). In the British Museum Collection are specimens of the *wet-season* form from Sikkim, taken in

the inner-discal spots interspaced by an olive-grey band, and both outer-discal series bordered by violet-white; a small blackish lunule with whitish outer edge and contiguous speckles below the cell. *Hindwing* also with prominent black basal transverse slender interrupted lines, and a more irregularly-broken inner-discal line, followed by a medial-discal row of very small spots, an outer-discal row of conical spots, each being contiguously bordered inwardly by small black dashes, and outwardly by a row of small spots in pairs; the basal, subbasal, and discal series each interspaced by a pale olive-grey band, and the outer-discal series by a white band. *Body* fulvous; thorax clothed with olive hairs; head black, spotted with white; palpi above olive, tip black, beneath white; body beneath and legs olivaceous-grey; thorax black streaked; femora black streaked; antennæ black.

Female. Upperside. Ground-colour of the forewing either rich olivaceous-fulvous-brown, and of the hindwing dark fulvous-red, very similar to the male, and both wings with markings, also as in male, or the forewing is much more dusky fulvous-brown with greyish lower-discal longitudinal streaks, and the hindwing paler and entirely greyish—or sometimes with a fulvescent basal discal flush, and both wings with more prominent black markings. Occasionally the female has the whole basal areas of both wings uniformly dark fuliginous-grey. Underside similar to male, except that the basal ground-colour is duller and paler red, and the outer area dull olivaceous-ochreous; all the markings as in male.

Expanse, ♂  $2\frac{6}{10}$  to  $3\frac{5}{10}$ , ♀ 3 to  $4\frac{2}{10}$  inches.

HABITAT.—Nepal; Sikkim; Bhotan; Assam; Cachar; Silhet; Khasias; Burma; Tenasserim; Malay Peninsula; Hong Kong; Hainan.

ABERRATIONS.—(Plate 353, fig. 1, 1a, b, c, ♂.)

A. (*C. Thebava*, fig. 1, 1a.) Male. Upperside. Basal ground-colour of both wings rich fulvous-red, as in normal male, the ordinary black markings being absent. *Forewing* with two broad black cell-bars, the black apical area crossed by a medial-discal row of five white spots, the three upper being linear in shape, the two lower broader and with a black central streak; marginal white angled-marks prominent. *Hindwing* with ordinary black outer margin and white angled-marks. Underside. Ground-colour as in normal male. *Forewing* with broader white borders to the cell-bars; inner transverse discal marks obsolescent; the medial-discal row of white spots, as on upperside, but broader; outer marginal angular lines well-defined. *Hindwing* with the ordinary subbasal, medial and outer discal markings obsolescent; outer marginal angular lines well-defined.

Expanse, 3 inches. (Yendaw, Burma. Coll. Grose-Smith.)

B. (Fig. 1, b, c.) Male. Upperside. Basal ground-colour of both wings bright fulvous-red. *Forewing* with prominent black broad cell-bars, and less-defined

blackish blotches below the cell ; a prominent outer-discal series of five white spots, and outer marginal angled-marks. *Hindwing* with a broad blackish subbasal band, medial-discal series of decreasing angular spots, outer-discal row of rounded spots, and less-defined submarginal lunules before the black outer band ; marginal slender white angled-marks. *Underside*. Ground-colour normal and bright ; the markings of both wings as in ordinary male, except, that on the forewing the cell-bars and inner-discal transverse spots are broadly black, and on the hindwing, the basal, and subbasal band, and the inner-discal spots are also broadly black.

Expanse,  $3\frac{3}{10}$  inches. (Burma. Coll. Swinhoe.)

**DISTRIBUTION.**—We possess examples of both sexes from Nepal, Sikkim, Bhotan, Silhet, Khasias, Burma, and Hainan. It is “very common in Sikkim at all elevations up to 7000 feet ; also in Assam and the Khasia Hills. Mr. Wood-Mason took it in Cachar ; the Indian Museum, Calcutta, has specimens from Silhet, Upper Assam, and Shillong. Capt. C. T. Bingham took it in the Thoungyeen forests in March and April, and in the Donat Range in July. It occurs also in Upper Burma, Mergui, Perak, and Hainan” (de Nicéville, *l.c.* ii. p. 36). “In Sikkim, it is found almost throughout the year, occurring commonly up to 7000 feet elevation. The larva, feeding in great numbers, on the common white and blue Passion flower” (Ditto, Sikk. Gaz. 1894, 133). “In the north of Upper Burma and in the Hills of Lower Burma, this species replaces *C. Cyane*” (Capt. C. H. E. Adamson, List 1897, 18). Signor L. Fea took it in Burma at Peupoli in June and July, at Meteleo in August, and at Bhamo in November. Mr. J. J. Walker obtained it in Hong Kong. It is recorded from Tonkin (Oberthür, *Etudes Ent.* 1893, 9). Mr. J. H. Leech has examples from W. and C. China.

**INDO-MALAYAN SPECIES.**—*Cethosia Eurymena*, Felder, *Reise Nov. Lep.* iii. p. 384 (1867). Semper, *Reisen Arch. Phil. Lep.* p. 102, pl. 18, fig. 1, 2, 3, ♂ ♀ (1888). *Habitat*. Philippines.—*Cethosia Sandakana*, Fruhstorfer, *Soc. Ent. Jahr.* No. 21 (1899). *Habitat*. N. Borneo.—*Cethosia Javana*, Felder, *Reise Nov. Lep.* iii. p. 384 (1867). *Habitat*. Java.—*Cethosia Logani*, Distant, *Rhop. Malayana*, p. 170, pl. 8, fig. 5, ♂ (1883). de Nicéville, *Journ. As. Soc. Bengal*, 1895, p. 401. *Habitat*. Malay Peninsula ; Sumatra.—*Cethosia Penthesilea* (Pap. *Penthesilea*, Cramer, *Pap. Exot.* ii. pl. 45, fig. A, B (1779). Snellen, *Tijd. v. Ned.* 1895, p. 7, pl. 1, fig. 2. *Habitat*. Java ; Sumatra.—*Cethosia Methypsea*, Butler, *Trans. Linn. Soc. Zool.* 1877, p. 543. Distant, *Rhop. Malay.* p. 171, pl. 8, fig. 9, ♂ (1883). *Habitat*. Malay Peninsula.—*Cethosia Carolina*, Forbes, *Wanderings in Eastern Archipelago*, p. 274 (1885). *Habitat*. Sumatra.—*Cethosia Hypsina*, Felder, *Reise Nov. Lep.* iii. p. 385 (1867). Distant, *Rhop. Malay.* p. 172, pl. 8, fig. 6, 7, 8, ♂ ♀ (1883). *Habitat*. Malay Peninsula ; Sumatra.—*Cethosia Hypsea*, Doubleday and Hewitson, *Gen. D. Lep.* pl. 20, fig. 4 (1847). *Habitat*. Labuan, Sarawak, Borneo.—*Cethosia*

*Æole*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 154 (1857). *Habitat.* Sumatra; Java; Borneo.—*Cethosia Gabina*, Weymer, Putb. Nachr. 1883, p. 191. Kheil, Rhop. Nias, p. 20, pl. 2, fig. 6, ♂, pl. 5, fig. 26, ♀ (1884). *Habitat.* Nias Island.—*Cethosia Mindanensis*, Felder, Wien. Ent. Monats. vii. p. 106, ♂ ♀ (1863). Semper, Reisen Phil. Lep. p. 100, pl. 18, fig. 4, 5, ♂ ♀ (1888). *Habitat.* Mindanao.—*Cethosia Luzonica*, Felder, Wien. Ent. Mon. vii. p. 107 (1863). Semper, *l.c.* p. 101, pl. 18, fig. 6, 7, 8, ♂ ♀ (1888). *Habitat.* Luzon.—*Cethosia Magindanica*, Semper, Reisen Phil. Lep. p. 102 (1888). *Habitat.* Mindanao.—*Cethosia Pariana*, Semper, *l.c.* p. 101 (1888). *Habitat.* Philippines.—*Cethosia Boholica*, Semper, *l.c.* p. 101, pl. 18, fig. 9, ♂ (1888). *Habitat.* Bohol, Philippines.—*Cethosia Leschenaultii*, Godart, Enc. Méth. ix. Suppl. p. 816 (1823). Lucas, Lep. Exot. pl. 54, fig. 3 (1835). *Habitat.* Java.

### Genus CYNTHIA.

*Cynthia*, Fabricius, Illiger's Mag. iv. p. 281 (1807). Doubleday, Gen. Diurnal Lep. i. p. 212 (1849). Moore, Lep. of Ceylon, i. p. 52 (1881). Distant, Rhop. Malay. p. 183 (1882). de Nicéville, Butt. of India, ii. p. 40 (1886). Semper, Reis. Phil. Lep. p. 104 (1888). *Anartia* (part), Hübner, Verz. bek. Schmett. p. 33 (1816).

IMAGO.—Wings large, broad. Male. *Forewing* triangular; costa much curved towards the end, apex rounded and somewhat falcated; exterior margin oblique, concave in the middle, slightly sinuous; posterior margin short and recurved; costal vein extending to two-thirds the margin; first subcostal branch emitted immediately before end of the cell, second branch at a very short distance beyond its end, third branch at one-half beyond the cell, fourth and fifth from close to base of the third; cell long, narrow, its upper end extending to half the wing; upper discocellular extremely short, bent outward; middle discocellular bent inward, curved; lower discocellular long, curving very obliquely outward; radials from their angles; middle median branch emitted before lower end of the cell; upper median much arched; lower median emitted at one-half of lower length of the cell; submedian much recurved. *Hindwing* short, very broad, somewhat quadrate; exterior margin scalloped, angled and produced to a point at end of upper median branch; costal vein much arched, extending to the apex; precostal vein bifid; first subcostal emitted at half length of upper part of the cell, the radial curving from below second subcostal; cell open, narrow; two upper median branches emitted at more than half distance beyond upper end of cell; submedian vein slightly recurved; internal vein short, recurved. *Body* stout; abdomen short; palpi ascending, densely clothed, set in front and sides with long setæ, second joint long, extending to the level of vertex, third joint short, pointed; forelegs of male slender, rather long, scaly above, finely hairy beneath, tarsus thickly hairy; forelegs of female very slender, smoothly scaled,

femur hairy beneath, tarsus much dilated beneath and abruptly rounded to the tip, spines stout; antennæ long, with a short club; eyes naked.

LARVA.—[Saloma.] “Cylindrical. Head armed with two, large, curved spiny horns; the segments armed with six rows of well-branched-spines.”

PUPA.—Suspended. “Very grotesque; with two extraordinary expansions, like bats’ wings, springing from the basal abdominal segment, a smaller pair on the penultimate segment, and a large angular dorsal prominence above the head” (*Davidson and Aitken, l.c.*).

TYPE.—*C. Arsinoë*.

FOOD-PLANT AND HABITS OF LARVA.—“Found on the wild Passion flower (*Modecca palmata*). It is a night feeder, returning to some distance, often to another plant, during the day” (*Ditto*).

### CYNTHIA EROTA.

*Wet season form* (Plate 354, fig. 1, 1a, b, c, ♂ ♀).

*Papilio Erota*, Fabricius, Ent. Syst. iii. i. p. 76, ♀ (1793).

*Cynthia Erota*, Butler, Catal. Fabr. Lep. B. M. p. 115 (1869). Moore, Proc. Zool. Soc. Lond. 1877, p. 584. de Nicéville, Butt. of India, ii. p. 41, pl. 21, fig. 97, ♂ ♀ (1886). Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 277. Manders, Ent. Monthly Mag. 1888, p. 37, *larva* and *pupa*.

IMAGO.—Male. Upperside bright olivescens ferruginous-ochreous, the discal area across both wings slightly paler. Cilia grey. *Forewing* with two black waved lines crossing middle of the cell, another near the end, and two very fine lines enclosing the discocellulars; a black transverse inner-discal somewhat lunulated interrupted line, a paler blackish or brownish-ochreous medial-discal sinuous line, followed by a curved series of six small black dentate spots, the middle pair being indistinct or obsolete, the upper pair the largest and with a pale central dot; beyond is a black submarginal waved line enclosing a pale ochreous spot at the apex, and then a marginal sinuous line. *Hindwing* crossed by a black narrow inner-discal almost straight line, beyond which the ground-colour is broadly and distinctly paler towards the costa and is defined outwardly by a medial discal transverse slightly blackish or brownish-ochreous ill-defined wavy line evanescently decreasing hindward, beyond which the outer-discal area is traversed by a dusky fascia bearing two prominent ocelli, the upper ocellus placed in the upper discoidal interspace, the lower one in the lower median interspace, these ocelli being composed of a black centre, a violet pupil, and slender black outer ring; a smaller obsolescent ocellus is also slightly apparent above the anal angle, and one also is sometimes present in the subcostal interspace; followed by a black submarginal and a marginal sinuous line, enclosing a small violet patch at anal angle. Underside paler ochreous, the basal



areas tinged with red ; markings somewhat similar to upperside, but more slender and red-edged, the basal lines distinct. *Forewing* also with a slender black subbasal line below the cell, the inner-discal transverse line almost straight, the outer-discal lower black spots being obsolete, the three upper prominent and lilacine-white ; the submarginal line almost straight, the marginal line indistinct. *Hindwing* also with a distinct slender black subbasal line and discocellular angular mark ; the outer margin broadly glossy violaceous, the dusky fascia more distinct, the ocelli olive with smaller black centre and larger white pupil, a bipupilled blackish speckled patch at the anal angle ; marginal sinuous line indistinct. *Body* above olivescient-ochreous ; palpi ochreous ; body and palpi beneath, and legs pale ochreous ; antennæ above black, beneath reddish-ochreous.

Female. Upperside. Basal areas olive-brown or olivescient-brownish-grey, the outer borders olivescient ochreous-brown ; markings similar to male ; the interspace between the transverse inner and medial-discal sinuous line, and the borders of the outer-discal marks on *forewing* being olivescient greyish-white ; ocelli of *hindwing* prominent and with ochreous inner ring. Underside paler than in male, and greyish-ochreous ; markings similar but ochreous-brown.

Expanse, ♂  $3\frac{4}{10}$  to  $4\frac{2}{10}$ , ♀ 4 to  $4\frac{8}{10}$  inches.

*Dry-season form* (Plate 355, fig. 1, 1a, b, c, ♂ ♀).

*Cynthia Pura*, Swinhoe, Annals of Nat. Hist. 1894, p. 429, ♂ ♀.

*Cynthia Circe*, Fawcett, Annals of Nat. Hist. 1897, p. 111, ♂ ♀.

Male and female. Smaller than *wet-season* form. Male. Upperside. Both wings paler ferruginous-ochreous, markings similar but much less defined and more slender ; the inner-discal transverse line less sinuous, being almost straight ; the medial-discal zigzag line obsolescent or absent, the outer-discal spots on *forewing* small ; the ocelli on *hindwing* smaller and narrower ; the outer angle at end of upper median veinlet short and obtuse. Underside brightly coloured, the basal areas tinged with crimson ; the basal sinuous lines darker crimson ; ocelli on *hindwing* small and narrow.

Female. Upperside. Both wings with a broad ochreous-white discal band ; the basal areas ochreous-grey, much the palest on the *hindwing*. *Forewing* with blackish cell-bars, obsolescent discal markings ; the outer border ochreous-brown, the two black sinuous marginal lines prominent. *Hindwing* with the outer-discal area pale ochreous, the outer margin being rich brownish-ochreous with prominent sinuous submarginal lines, the two ocelli small, as in male. Underside paler and more yellowish than in male, the discal area on *hindwings* being pale yellow.

Expanse, ♂  $3\frac{2}{10}$  to  $3\frac{4}{10}$ , ♀  $3\frac{4}{10}$  to  $3\frac{6}{10}$  inches.

LARVA.—“ Full fed,  $1\frac{1}{2}$  inch in length. Pale olive-green, considerably darker

between the segments; six short spines on each segment, the two upper much the longest, all with yellow bases; spiracles marked as a black dot, pale whitish on either side; legs dark brown. Head dark brown, with two upright horns, half an inch in length, curving backwards."

PUPA.—"Suspended by tail. Colour, varying shades of brown. A prominent ridge over thorax; two alæ anteriorly narrowly pointed on either side of outer margin of wing cover; two smaller alæ on either side of the 12th segment; between the alæ and on either side of dorsum two pairs of diamond-shaped spots, pale green, one pair behind posterior alæ; two silver spots on either side of thoracic ridge anteriorly, and three splashes of silver posteriorly; a dark line extends from the outer margin of the wing-cover to tail. Fifteen days in pupa" (Dr. N. Manders, *l.c.*).

HABITAT.—North East India; Burma; Upper Tenasserim.

DISTRIBUTION.—"Males of this species are very common in Sikkim, also in Assam and the Khasia Hills. They are very powerful on the wing, and frequent damp spots, where they suck up the moisture. The females are less frequently seen" (de Nicéville, *l.c.* p. 42). "Common in Sikkim from the Terai to 6000 feet elevation almost all the year round. I have bred this species from larvæ taken in great numbers on the Passion flower, in October. The specimens which emerge in the early spring from larvæ fed up in the late autumn are much smaller, and the females much lighter coloured, than the later broods of the year" (Ditto, Sikkim Gaz. 1894, 133). "It is generally spread throughout the hilly parts of Burma. I found males very common on one occasion near Phapoon, in November, and again near Bhamo, where I caught one female in October. Females are very uncommon" (Capt. C. H. E. Adamson, List 1897, 181). Signor L. Fea obtained it at Yado, in June, at Cheba, 900 to 1000 feet elevation, in July, at Meteleo in August, and also in the Karen Hills. Capt. C. T. Bingham took it in the Thoungyeen forests, Upper Tenasserim, in September. Major Fawcett obtained it in Tounghoo from March to June, and at Beeling, Upper Tenasserim. Mr. B. Tucker took it in Tavoy in December. Dr. N. Manders obtained it and reared the larvæ at Lasho, Shan States, Burma (Ent, Mo. Mag, 1888, 37).

#### CYNTHIA PALLIDA.

*Cynthia Pallida*, Staudinger, Exot. Schmett. i. p. 89 (1885).

IMAGO.—Male. Upperside paler than in N.E. Indian and Burmese *Erota*, the transverse medial area paler than in dry-season form of *Asela*, the medial-discal sinuous markings on the forewing being also less defined, and the outer-discal spots—especially the upper—smaller. On the hindwing the outer-discal dusky fascia is

broader and more diffused, the two ocelli being also comparatively smaller. Underside paler throughout than in *Erota*, the basal area being of the same tint of colour as the outer area.

Female. Upperside. Basal and outer areas paler and more olivescient-grey than in *Erota*, paler still in the dry-season form; the outer borders also paler and olivescient, being still more diffusedly paler olivescient-grey on the outer-discal area of the hindwing. Underside much paler throughout than in *Erota*, the medial discal fascia whitish.

Expanse, ♂  $3\frac{6}{10}$ , ♀  $3\frac{6}{10}$  to  $4\frac{2}{10}$  inches.

HABITAT.—South Andamans.

**CYNTHIA SALOMA** (Plate 356, fig. 1, *larva* and *pupa*, fig. 1a, b, ♂ ♀, *Wet-season*. Plate 357, fig. 1, 1a, b, c, ♂ ♀, *Dry-season*).

*Cynthia Saloma*, Swinhoe, de Nicéville's Butt. of India, ii. p. 43 (1886); Proc. Zool. Soc. 1889, p. 396. Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 270, pl. B, fig. 2, 2a, *larva* and *pupa*.

IMAGO. Male. Upperside with the basal and external areas in both the *wet* and *dry-season* forms darker ferruginous-ochreous than in typical *Erota*, most conspicuously so in the dry-season, in which latter form the discal transverse area is also distinctly much paler, and the two medial sinuous lines are very slightly defined or obsolete. In both forms the inner-discal black line on the forewing is much straighter, the two outer marginal lines on forewing also somewhat less sinuous; the inner line on hindwing more sinuous and its two ocelli less prominent; the violaceous anal patch absent. Underside paler, the discal area still paler; markings as above; on the hindwing the violaceous washing is duller and more restricted, or in some specimens barely traceable.

Female. Upperside. Basal areas much deeper and richer olive than in *Erota*, much the darkest in *wet-season* form, the outer borders also much darker. *Forewing* with the transverse discal white band broader anteriorly, the medial-discal traversing sinuous line less defined or diffused, the outer-discal black-pointed patches more prominent, the lower patch being bordered with olive-grey. *Hindwing* with the discal white band restricted to the costal and subcostal interspace, the discal area below it being broadly dark olive-grey or bluish-grey; ocelli larger and the pupil central. Underside paler than in *Erota*, the ground-colour pale olivescient yellowish-ochreous; markings similar; ocelli on hindwing larger.

Expanse, *Wet*, ♂ 4, ♀ 4 to  $4\frac{4}{10}$  inches.

*Dry*, ♂  $3\frac{8}{10}$ , ♀  $3\frac{6}{10}$  inches.

LARVA.—“Larva cylindrical; head armed with two large, curved, spiny horns,

the body with six rows of well-branched-spines; colour pale yellow; lightly marbled with dark brown; head black, with an inverted V of yellow; under parts black."

PUPA.—"Very grotesque; two extraordinary expansions, like bats' wings, springing from the basal abdominal segment, a smaller pair on the penultimate segment, and a large, angular, dorsal prominence above the head; colour light or dark brown, with two rows of subdorsal silver spots on thorax and three pairs of green spots on the abdominal segments" (Davidson and Aitken, *l.c.*).

HABITAT.—South India.

DISTRIBUTION.—"Pretty common, in the North Kanara District of Bombay, everywhere in forest, from August to September onwards. Males congregate on the peaks of hills to bask in the sun. Monsoon specimens are conspicuously darker than those found in the dry season. The female is often difficult to tell from *Parenthos virens*, on the wing, its flight being similar, though less powerful" (Davidson and Aitken, *l.c.* 1896, 248). "Mr. R. Morgan has taken both sexes in the Wynaad, as also has Mr. H. S. Ferguson in Travancore. Mr. F. W. Bourdillon says of this species, "Occurs in Trevandrum at about 2000 feet elevation, is uncommon and difficult to secure owing to its strong flight and habit of settling twenty or thirty feet from the ground" (de Nicéville, *l.c.* 43). "Both sexes common on the Western slopes of the Nilgiris, rare throughout the rest of the District" (Hampson, Journ. As. Soc. Bengal, 1888, 352). Capt. E. Y. Watson records a single male taken at Gersoppa Falls, Mysore, in January" (Journ. Bombay N. H. S. 1890, 4).

FOOD-PLANT AND HABITS OF LARVA.—Messrs. Davidson and Aitken "found the larva feeding on the wild Passion-flower (*Modecca palmata*) about the end of September. It must have been plentiful earlier, as the butterfly came out about the beginning of July, and was common enough all through the rains. It is a night-feeder, returning to some distance, often to another plant, during the day" (*l.c.* 1890, 270).

**CYNTHIA ASELA** (Plate 358, fig. 1, larva and pupa, fig. 1, a, b, ♂ ♀).

*Cynthia Asela*, Moore, Proc. Zool. Soc. 1872, p. 558; Lep. of Ceylon, i. p. 53, pl. 26, fig. 1, 1a, ♂ ♀, 1b, c, larva and pupa (1881). de Nicéville, Butt. of India, ii. p. 43 (1886).

IMAGO.—Male. Upperside bright olivescens ochreous-yellow, darkest on the basal areas. Forewing with black cell and discocellular streaks, a streak below the cell, a transverse inner-discal interrupted sinuous line, an outer-discal row of more or less obsolete dentate spots, the upper one being pale-centred, two marginal sinuous lines, and a medial-discal indistinct darker ochreous sinuous line. Hindwing with a black inner-discal transverse straight line, a medial-discal darker

March and May, also from the Khasias and Perak, and of the *dry-season* form from the Karen Hills, December, Beeling, Upper Tenasserim, and East Pegu.

Of our illustrations of this species on Plate 361, figs. 1, 1a, b, are from a male and female *wet-season* form, and figs. 1, c, d, from a male of the *dry-season* form.

**ATELLA FRATERNA** (Plate 361, fig. 2, 2a, b, ♂ ♀).

Male and female. Upperside somewhat paler than in *A. Alcippoides*. Markings similar, except that on the *forewing* the inner-discal oblique costal streak is very broad anteriorly and decreasingly attenuated hindward; and there is a medial-discal sinuous series of marks; the outer-discal lower spots are smaller, narrower, and are disposed obliquely outward; the marginal ochreous lunules are more dentate in shape. On the *hindwing*, the medial-discal black line is more regular in its course and less sinuous. Underside paler yellowish-ochreous than in *Alcippoides*; outer markings more distinctly bordered by pale violaceous-grey.

Expanse, ♂ ♀  $1\frac{6}{10}$  to  $2\frac{2}{10}$  inches.

HABITAT.—Nicobar Islands.

DISTRIBUTION.—Occurs on Little Nicobar, Nankauri, Teressa, and Kutschall, Nicobar Islands.

INDO-MALAYAN SPECIES.—*Atella Luzonica* (A. Phalanta, Semper, Reis. Phil. Lep. p. 126, pl. A, fig. 6, *larva* and *pupa*). *Habitat*. Luzon; Mindoro; Philippines.—*Atella Semperi* (A. Alcippe, Semper, l.c. p. 127, pl. 20, fig. 8, 9, ♂ ♀ (1888). *Habitat*. Luzon; Philippines.—*Atella pallidior*, Staudinger, Deuts. Ent. Zeit. 1889, p. 48. *Habitat*. Palawan.—*Atella Alcippe* (Pap. Alcippe, Cramer, Pap. Exot. iv. pl. 389, fig. G, H (1782). Herbst, Nat. Ins. ix. pl. 257, fig. 5, 6. A distinct species. Underside with the outer-discal and the two submarginal sinuous lines black and prominently white bordered; the outer-discal row of spots on both wings are also prominently black. *Habitat*. Amboina; Ke Island; Moluccas.

**Genus ISSORIA.**

*Issoria*, Hübner, Verz. bek. Schmett. p. 31 (1816); *id.* Beiträge, iv. p. 32, fig. 735-6 (1832). Semper, Reis. Phil. Lep. p. 110 (1888).

*Atella* (sect. 2), Felder, Neues Lep. p. 9 (1864).

IMAGO.—Male. *Forewing* triangular; costa arched, apex obtusely rounded, exterior margin very oblique, even, posterior angle obtusely pointed; costal vein extending to fully half the margin; first subcostal branch emitted before end of the cell, second at some distance beyond the end, third at one-third beyond and ending before the apex, fourth and fifth at two-thirds; cell rather narrow; upper

discocellular very short, inwardly-oblique, middle discocellular inwardly-oblique and concave, lower discocellular inwardly recurved; middle median branch emitted immediately before lower end of the cell, lower median at about half way; submedian vein recurved. *Hindwing* short, broad, somewhat quadrate; apex convex, exterior margin slightly oblique, scalloped and produced outward at end of upper median veinlet into a broad caudate angle; precostal vein slightly curved outward; cell closed by a very slender outwardly recurved discocellular; two upper median branches from immediately beyond lower end of the cell. *Thorax* rather stout; head broad and hairy; palpi projecting above the head, second joint tumid, pilose, apical joint very slender, naked; forelegs of male laxly hairy; forelegs of female slender, tibia and tarsus very sparsely hairy laterally, tarsal joints wide apart, spined; antennæ with a rather stout club; eyes naked.

TYPE.—I. Egista.

LARVA.—Unknown.

#### ISSORIA SINHA (Plate 359, fig. 2, 2a, b, ♂ ♀).

*Terinos Sinha*, Kollar, Hügel's Reise Kaschmir, iv. pt. 2, p. 438 (1844).

*Atella Sinha*, Butler, Trans. Linn. Soc. Zool. 1877, p. 544. Moore, P. Z. S. 1878, p. 828. Distant, Rhop. Malayana, p. 175, pl. 10, fig. 8, ♂ (1882). de Nicéville, Butt of India, ii. p. 29, pl. 20, fig. 87, ♀ (1886); *id.* Journ. As. Soc. Bengal, 1895, p. 400. Snellen, Tijds. voor. Ent. 1892, p. 5.

*Issoria Sinha*, Semper, Reisen Phil. Lep. p. 110 (1888).

*Atella Creaghana*, Pryer and Cator, Brit. N. Borneo Herald, 1894, p. 260.

*Issoria Egista*, Hübner, Zuträge, iv. p. 32, fig. 735-6 (1832).

IMAGO.—Male and female. Upperside. *Forewing* with the anterior half, from base of costa to about one-third from the base of posterior margin below the cell, to upper median, and then narrowly down the outer margin, rich olivescient ochreous-brown, the apical interspaces between the markings and the marginal border being ochreous-black, the lower-discal area bright rich deep yellowish-ochreous; two black slender wavy lines across middle of cell, two at its end, a black sinuous edge to the dark portion below the cell, and two outer-discal small lunate spots placed between the median veinlets; a broad, yellowish-ochreous oblique streak from the costa, beyond the cell, divided by the subcostals; a similar subapical streak beyond, extending to the upper median, its middle portion cut with a central black dentate mark, and the lower portion outwardly filled up with black and occasionally having a central ochreous dot; outer border traversed by a slender ochreous lunular line. *Hindwing* rich deep yellowish-ochreous basally, merging to darker olivescient-ochreous discally, the outer border being ochreous-black; an outer-discal row of five

small black spots, followed by a submarginal ochreous lunular line, and a less apparent slender similar marginal line. Underside. Markings similar to upperside. *Forewing* with the basal and apical dark portions various shades of chestnut-brown washed with violet; base of cell and space between the two pairs of cell-bars, the oblique costal streak, subcostal streak and its lower-discal series of lunules, all violet-white; lower-discal area and outer margin pale ochreous. *Hindwing* with the costal base and outer border pale ochreous; discal area violaceous; interspace of cell-bars, edge of an inner-discal sinuous line, and a medial-discal series of decreasing lunules violet-white; an outer-discal row of black spots more or less diffusedly surrounded with reddish-ochreous; marginal lunular line dusky-brown. *Body* and palpi above olivescence-brown; beneath, and femora beneath whitish; legs pale ochreous; antennæ black above, tip and shaft beneath reddish-ochreous.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{8}{10}$  to 3 inches.

HABITAT.—West and Eastern Himalayas; Assam; Khasias; Silhet; Cachar, Orissa; Burma; Tenasserim; Malay Peninsula; Sumatra; Java; Borneo; Philippines.

DISTRIBUTION.—In the Western Himalayas, Mr. P. W. Mackinnon records it as “occurring in the Valleys to the north of Masuri in April and August, and in the Dun from August to December. Rare. We have it also from the Bhilung District of Tehri Garwhal, taken in September” (Journ. Bombay N. H. S. 1898, 368). Mr. W. Doherty found it “common in the Kali Valley, Kumaon, at 2000 to 3000 feet elevation” (Journ. As. Soc. Bengal, 1886, 121). We possess examples from Nepal, Sikkim, Bhotan, the Khasias; Chindwin, Burma, taken in December by Colonel C. H. E. Adamson; Malacca; Sumatra, and Java. It is “not very common in Sikkim, but is found from 2000 to 3000 feet elevation, from May to October. I have never seen a female of this species, though hundreds have passed through my hands. Mr. Dudgeon reports it as occurring more commonly East of the Tista River, at the same elevations. He has observed the female in June, depositing eggs, at 2500 feet elevation” (de Nicéville, Sikk. Gazetteer, 1894, 132). “In Burma, this insect is not uncommon on the gravelly beds of streams in the cold weather. Its flight is very strong and rapid. It invariably rests with the wings crossed over its back, and is in all its habits quite different from *Atella Phalanta* and *Aleippe*” (Col. Adamson List, p. 17). Dr. J. Anderson took it in “Mergui, in the cold weather” (J. Linn. Soc. Zool. 1886, 34). Dr. N Manders found it “not a common species in the Shan States. Taken at Yatsouk and Fort Stedman” (Tr. Ent. Soc. 1890, 520).

MALAY SPECIES.—*Issoria Egista* (Pap. Egista, Cramer, Pap. Exot. iii. pl. 281, fig. C, D (1782). Semper, Reis. Phil. Lep. p. 110, fig. (1888). *Atella Egista*, Kirby Catal. D. Lep. p. 154 (1871). *Habitat*. Moluccas.

## Genus CUPHA.

*Cupha*, Billberg, Enum. Ins. p. 79 (1820). Moore, Lep. of Ceylon, i. p. 64 (1881). Distant, Rhop.

Malayana, p. 176 (1882). de Nicéville, Butt. of India, ii. p. 21 (1886).

*Messaras*, Doubleday, Gen. Diurnal Lep. i. p. 163 (1848).

IMAGO.—Male. Wings short, broad. *Forewing* subtriangular; costa much arched from the base, apex very obtuse; exterior margin very slightly oblique and waved in the middle; costal vein extending to half the margin; first and second subcostal branches very short; first subcostal emitted at end of the cell, second at one-sixth beyond end of the cell, third branch at two-sixths from its end, fourth and fifth at two-thirds beyond; upper discocellular extremely short, almost obsolete, middle discocellular starting from close to the subcostal and deeply concave below, lower discocellular very slender and slightly concave, radials from angle and end of the upper; cell very short and broad; two upper median branches emitted at end of the cell, lower median at one-third before its end; sub-median vein nearly straight. *Hindwing* broadly oval; exterior margin very convex, waved; costal vein extending to the apex; precostal vein curved outward; first subcostal branch emitted at one-third before end of the cell; cell open; median branches wide apart; submedian and internal vein straight. *Body* short, somewhat slender; palpi ascending, finely pilose, second joint long, extending half its length beyond the head, third joint short, slender, pointed; forelegs slender, of male finely hairy; forelegs of female scaly, tarsal joints spined; antennæ with a gradually formed club; eyes naked.

TYPE.—*C. Erymanthis*.

LARVA.—Cylindrical; armed with longitudinal rows of blackish branched-spines. Colour brown or pale green.

PUPA.—Brown or pale green; with a double row of long slender red filaments.

## CUPHA ERYMANTHIS (Plate 362, fig. 1, 1a, b, c, ♂ ♀).

*Papilio Erymanthis*, Drury, Illust. Exot. Ent. i. pl. 15, fig. 3, 4, ♀ (1770). Cramer, Pap. Exot. iii. pl. 283, fig. F, G, ♂ (1779). Donovan, Ins. of China, pl. 35, fig. 1, ♂ (1798).

*Argynnis Erymanthis*, Westwood, 2nd Edit. Donovan, Ins. China, p. 64, pl. 35, fig. 1, ♂ (1842).

*Messaras Erymanthis*, Doubleday, Gen. D. Lep. i. p. 163 (1848).

*Cupha Erymanthis*, Billberg, Enum. Ins. p. 79 (1820). Distant, Rhop. Malayana, p. 176, pl. 8, fig. 4, ♂ (1882). de Nicéville, Butt. of India, ii. p. 22 (1886).

*Papilio Lotis*, Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 6 (1776).

*Messaras Nicobarica*, Felder, Verh. Zool. Bot. Gesells. Wien. xii. p. 486 (1862).

*Messaras disjuncta*, Weymer, Stett. Ent. Zeit. 1885, p. 263.

IMAGO.—Male and female. Upperside olivescient brownish-ochreous. *Forewing* with a slightly-defined black very slender broken ringlet-mark across middle of the cell, and two waved sinuous lines at its end; a broad transverse discal pale



yellowish-ochreous irregular margined band extending from the costa to submedian veinlet, its inner-edge sinuously black bordered and its outer-edge more waved; the apical area beyond being ochreous-black and containing two small outwardly-oblique subapical ochreous spots, the lowest being most distinct and palest, the upper one smallest and more or less obsolescent; within the lower-discal area of the yellowish band are two small rounded black inwardly-oblique spots placed in the median interspaces, and then a larger somewhat quadrate black lower spot outwardly-disposed above the submedian and which is joined to a narrow sinuous black submarginal line ascending to the upper median veinlet. *Hindwing* crossed by a very slender black inner-discal broken sinuous line, a medial-discal straighter lunular line outwardly-bordered by pale yellowish lunules which widen and are somewhat whitish anteriorly, the costal space between the upper end of the lines being also whitish; beyond is an outer-discal row of five rounded black spots, the penultimate upper one the largest, followed by a black submarginal sinuous rather broad line, and then a marginal lunular line, the extreme outer margin being also blackish. Underside paler brownish-ochreous. *Forewing* with the apical area also pale brownish-ochreous, the discal broad band paler and duller yellow, its sinuous inner-edge slenderly defined, its lower-discal area being traversed by the three black spots, as on upperside, and on the apical area above these are succeeded by a series of small black pale-edged dentate spots, the whole preceded by an inner row of slender blackish pale outward-bordered lunules, of which latter the two upper are the largest; beyond are two less-defined slender sinuous marginal lines; cell-marks brownish-ochreous. *Hindwing* marked as on upperside; the inner-discal and marginal lines being less-defined, slender, and outwardly lunularly pale bordered, the medial-discal lunules prominent and lilacine-white, the discal black spots surrounded by reddish-ochreous. *Body* and palpi above olivescient brownish-ochreous, below, and legs pale yellowish-ochreous; antennæ above blackish, beneath reddish-ochreous.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{4}{10}$  to  $2\frac{8}{10}$  inches.

HABITAT.—Kumaon; Nepal; Sikkim; Bhotan; Naga and Khasia Hills; Silhet; Dacca; Burma; Tenasserim; Siam; Malay Peninsula; Nicobars; Nias; Sumatra; Java; Borneo; Hong Kong; Hainan; Formosa.

DISTRIBUTION.—This occurs along the foot of the Himalayas as far West as Kumaon, as stated by Mr. E. T. Atkinson in his Notes on Zool. of N.W. Prov. India. Mr. P. W. Mackinnon records it as "common in the Dehra Dun in May and October. A straggler or two is occasionally found in Masuri early in May" (J. Bombay N. H. S. 1898, 368). Mr. W. Doherty obtained it in the "River Valleys, in Kumaon, up to 5000 feet" (J. As. Soc. Bengal, 1886, 121). "In Sikkim it is never common, but appears to occur at low elevations throughout the warmer

months. I once caught a few specimens at Kalimpong in October. In Daling it is local at 3000 feet elevation" (de Nicéville, Sikk. Gazetteer, 1894, 132). Capt. M. J. Slater found it "tolerably plentiful at Dacca, 1844. It flies quietly and is easily captured. I used to find one or two almost invariably near a deep pool of stagnant water overhung with bamboo jungle" (MS. Notes, p. 148). "It has been taken at Shelapunji, in the Khasia Hills, in October. Mr. T. G. Moncrieffe took it at Rangoon. Dr. J. Anderson obtained it in the Mergui Archipelago from December to March, and Mr. O. Limborg at Moolai, Moolat, and at Hatseiga, Upper Tenasserim" (de Nicéville, *l.c.* 23). Signor L. Fea took it at Bhamo, in November. Col. C. H. E. Adamson records it as "common in Burma during the rainy season" (List 1897, 17). Dr. N. Manders found it "a common species in the Shan States, from 1000 to 3000 feet elevation; more rarely at higher elevations. It is almost invariably found near water, and affects open spaces in thick jungle" (Trans. Ent. Soc. 1890, 520). We possess examples from Nepal; Bhotan; Khasia Hills; Burma; Tenasserim; Nancoury and Camorta, Nicobars; Malay Peninsula; Sumatra; Java; Hainan and Formosa. Mr. J. J. Walker, R.N., records it as "a common butterfly in Hong Kong, specimens usually more or less worn being found from December to March, when a brood of larger and darker examples makes its appearance. The green, spiny, *Vanessa*-like larva is often found on *Glochidion eriocarpum*, a common roadside shrub with downy leaves, and the pupa, which is very angular and most brilliantly gilded, is attached to the twigs of the same plant. Both are very frequently infested with Ichneumons and Dipterous parasites" (Tr. Ent. Soc. 1895, 451).

Our illustrations on Plate 362 are from male and female Burmese examples.

**CUPHA MAJA** (Plate 362, fig. 2, *larva* and *pupa*, 2a, b, c, ♂ ♀).

*Cupha Maja*, Frühstorfer, Berl. Entom. Zeit. 1898, p. 198.

*Cupha Erymanthis*, Hampson, Journ. Asiatic Soc. Bengal, 1888, p. 352, *larva* and *pupa*.

*Cupha placida*, Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 247, pl. 3, fig. 3, *larva* and *pupa*.

IMAGO.—Male and female. *Forewing* with a comparatively more pointed apex, and the hindwing more distinctly angulated at end of upper median veinlet, than in *C. placida* and *Erymanthis*. Upperside dark olivescient ochreous-brown, darker than in *Erymanthis* from Sikkim, Bhotan or Burma. *Forewing* with the discal transverse band comparatively narrower and somewhat brighter yellowish-ochreous, its inner sinuous edge less black-bordered; the three lower-discal spots of equal size; sub-apical spots absent; the lower marginal lunules obsolescent. *Hindwing* with the two

inner-discal sinuous lines very indistinct or obsolescent, the discal row of black spots smaller, the submarginal and marginal line indistinct or obsolescent. Under-side. Basal area of both wings paler than in *Erymanthis*, in the male generally as pale as the band; the cell-marks and apex of *forewing*, and a subbasal sinuous fascia on *hindwing*, being darker brownish-ochreous; hindwing with the outer border also uniformly brownish-ochreous, the two marginal sinuous lines indistinct and not pale bordered; the discal violaceous lunules prominent, the outer-discal black spots small.

Expanse, ♂ 2 to  $2\frac{4}{10}$ , ♀  $2\frac{8}{10}$  inches.

LARVA.—Cylindrical. Brown or pale green; armed with longitudinal rows of blackish branched-spines.

PUPA.—Pale yellowish-green, with a double row of long slender red filaments.

HABITAT.—South India.

DISTRIBUTION.—“The Indian Museum, Calcutta, possesses examples from the Kadir District, Mysore, Ootacamund, Nilgiris, the Wynad, Kanara, and Travancore” (de Nicéville, Butt. Ind. ii. 23). We possess both sexes from Kanara, and the Nilgiris. Messrs. Davidson and Aitken record it as “very common, in the N. Kanara District, wherever the country is fairly well wooded, and more abundant in the dry season than during the rains. In habits it is very like *Atella Phalantha*, flitting restlessly from bush to bush, and keeping its wings in motion even when it alights. The larva, which feeds on the same plant (*Flacourtia*) as that species, is only distinguishable by the colour of the head and by the spines, which are inclined to be semi-transparent, these being black in *A. Phalantha*. The pupa can be recognized at once by a double row of slender filaments springing from the principal tubercles” (Journ. Bombay N. H. S. 1896, 247). In the Nilgiris, Mr. G. F. Hampson found it “common at 3000 to 6000 feet. Larva pale apple-green, with branching black spines. Pupa pale apple-green, with three pairs of red and black frontal processes, and red and black frontal streaks” (Journ. Asiat. Soc. Bengal, 1888, 352).

**CUPHA PLACIDA** (Plate 363, fig. 1, 1a, ♂ ♀).

*Cupha placida*, Moore, Lep. of Ceylon, i. p. 65, pl. 32, fig. 1 (1881). de Nicéville, Butt. of India, ii. p. 23 (1886).

IMAGO.—Male and female. Upperside much paler olivaceous brownish-ochreous than in N. Indian *Erymanthis* and S. Indian *Maja*. *Forewing* with the oblique discal band deep yellowish-ochreous, in some specimens being but slightly paler than the basal area, its inner sinuous black-edge very slenderly defined, its outer edge more regular and curving inward to the costa where it joins the inner end; cell-

marks slender; subapical spot obsolescent brownish-ochreous; lower-discal black spots very small and more or less slightly defined. *Hindwing* with a transverse inner-discal slender black sinuous line, medial-discal straight lunular line outwardly-bordered by whitish lunules; an outer-discal row of small black spots, followed by a submarginal sinuous line, a marginal lunular line, and an extreme outer marginal line. Underside pale brownish-ochreous. *Forewing* with the discal band of the same colour as the base, its lower outer area only being paler; markings on both wings similar to those in *Erymanthis*.

Expanse, ♂  $1\frac{3}{10}$  to  $2\frac{2}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—Ceylon.

DISTRIBUTION.—“A low country insect. Found sometimes in the hilly districts. Numerous only about April and May (F. M. Mackwood). Taken at Galle and Kandy” (Capt. Wade). “Widely distributed in Ceylon, but not abundant; more common in the low country; found rarely at Nuwara Eliya, in jungle near water, and is not easy to capture in good condition” (Dr. N. Manders, J. A. S. Bengal, 1899, 191).

#### CUPHA ANDAMANICA (Plate 363, fig. 2, ♂).

*Cupha Erymanthis*, de Nicéville, Butt. of India, ii. pl. 23, fig. 105, ♂.

IMAGO.—Male and female. Upperside very dark olivescient ochreous-brown, darker than in S. Indian *C. Maja*. *Forewing* with the transverse yellow band much paler and of more uniform width throughout its course than in Indian, Burmese, and Nicobar *Erymanthis*, its inner sinuous edge more diffusedly-black, the three lower-discal spots large; subapical ochreous spot small. *Hindwing* with the two inner-discal black sinuous lines comparatively wider and more continuous, the outer-discal row of black spots larger, and the outer lines more sinuous. Underside with similar markings to *Erymanthis*; the band on forewing of the same width as on upperside.

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

HABITAT.—South Andamans.

DISTRIBUTION.—Numerous examples received from Port Blair, South Andamans. It is quite different from the Nicobar form.

PHILIPPINE SPECIES.—*Cupha Arias* (Messaras Arias, Felder, Reis. Novara Lep. iii. p. 391 (1867). Semper, Reis. Phil. Lep. p. 109, pl. 20, fig. 6, 7, ♂ (1888). Frühstorfer, Berl. Ent. Zeit. 1897, p. 324. *Habitat*. Philippines.—*Cupha Dapatana* (Messaras Dapatana, Grose-Smith, Ann. Nat. Hist. 1887, p. 267). *Habitat*. Dapatan Island, Philippines.

Genus DUCAPA.

*Paduca*,\* Moore, Journ. Linn. Soc. Zool. (June) 1886, p. 34. Distant, Rhop. Malayana, p. 447 (1886). Semper, Reis. Phil. Lep. p. 106 (1888).

IMAGO.—Male. Forewing subtriangular; costa very slightly arched, apex rounded, exterior margin oblique and slightly waved, posterior margin nearly straight; cell short; first subcostal branch emitted at some distance before end of the cell, second branch at its end, third branch at one-half beyond the end, and fourth at three-fifths; upper discocellular extremely short, middle discocellular inwardly-oblique and deeply concave, lower discocellular also inwardly-oblique and concave posteriorly; middle median veinlet emitted at some distance beyond lower end of the cell. On the upperside is a *narrow streak of modified ochreous scales*, extending *along each side of both the radial veinlets*, from their base to more than half their length, which gives this portion of those veinlets the appearance of a feather, of which the vein itself is the shaft and the scales the barb. *Hindwing* short; exterior margin convex, slightly scalloped and somewhat angular at end of upper median veinlet; pre-costal vein short and bent outward; radial emitted from lower subcostal at some distance beyond its base; cell open; lower median starting from opposite base of radial, upper median at considerable distance beyond. On the upperside the *two subcostal branches are furnished with a similar positioned narrow streak of modified ochreous scales* along each side, as is present on the forewing. *Body* moderate; palpi porrect, second joint laxly hairy above and beneath; third joint short and slender; forelegs of male very slender, finely hairy; forelegs of female scaly, tarsal joints finely spined; antennal club moderately stout; eyes naked.

TYPE.—*D. fasciata*.

**DUCAPA FASCIATA** (Plate 363, fig. 3, 3a, b, c, ♂ ♀).

*Atella fasciata*, Felder, Wien. Entom. Monats. iv. p. 235 (1860).

*Cirrochroa fasciata*, Felder, Reise Novara, Lep. iii. p. 389, pl. 49, fig. 9, 10, ♂ (1867). de Nicéville, Butt. of India, ii. p. 119 (1886).

*Paduca fasciata*, Distant, Rhop. Malayana, p. 447, pl. 40, fig. 12, ♂ (1886). Semper, Reisen Phil. Lep. p. 107 (1888).

*Cirrochroa (Paduca) fasciata*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 412.

IMAGO.—Male. Upperside olivescient fuliginous-brown, almost black externally; the base thickly irrorated with yellowish-ochreous scales. *Forewing* with a distinct slender *ochreous streak of modified scales* extending *along each side of the two radial veinlets*

\* *Paduca* previously used, in May, 1886, by Distant, Rhop. Malayana, p. 375, for a genus of Hesperiidæ.

from their base to more than half the length, these streaks giving that portion of the veins the appearance of a feather of which the vein itself is the shaft and the scales the barb; between these veins is a narrow pale yellowish-ochreous spot, and another similar spot above; on the disc from below the upper median vein is an inwardly-oblique discal broad pale ochreous-yellow—or sometimes almost ochreous-white—band, which is almost evenly-edged on both sides; beyond is an outer-discal row of five rounded spots of the same colour, the lowest being almost obliterated or centred by a black spot, followed by a submarginal row of slender dentate lunules also of the same colour, these latter being outwardly-bordered by a black lunule, and then an obsolescent outer marginal line. *Hindwing* with a similar slender *ochreous streak of modified scales* as on forewing, extending from base of first and second subcostal; a transverse inner-discal broad pale ochreous-yellow or almost ochreous-white band which is either of equal width at each end or tapering hindward; an outer-discal narrower and somewhat macular band of the same colour inwardly bearing a row of six prominent black spots; beyond is a submarginal row of slender yellow lunules and a still finer obsolescent outer marginal line. Underside pale dull fuliginous-ochreous, the discal band and outer markings, as on upperside, paler yellowish-ochreous, the lower black spot on forewing and those on the hindwing being prominent. *Body* and palpi above fuliginous-brown, beneath and legs yellowish-ochreous; antennæ black.

**Female.** Upperside similar to male, except that the vein streaks are absent on both wings; and on the forewing the two upper-discal yellowish-ochreous spots are larger and conjoined. Underside pale fuliginous-ochreous; all the markings more defined than in male.

Expanse, ♂  $1\frac{8}{10}$  to  $2\frac{1}{10}$ , ♀  $2\frac{2}{10}$  inches.

**HABITAT.**—Upper and Lower Tenasserim; Malay Peninsula; Sumatra; Java; Borneo; Mindoro, Philippines.

**DISTRIBUTION.**—Col. C. H. E. Adamson records finding this insect “abundant on the road between Kaukaret and Myawaddee, Upper Tenasserim, on the 24th April, 1880, but not since met with” (List, Burm. Butt. p. 21 (1897)). “Dr. J. Anderson took two males and one female in the Mergui Archipelago during January and March. Capt. C. T. Bingham took it in the Upper Thoungyeen forests in April, the Donat Range, and in Kaukaret, Upper Tenasserim” (de Nicéville, *l.c.*). A male taken by Mr. Hawxwell in Upper Tenasserim is in Mr. Grose-Smith’s collection. We have examined specimens from Perak, Borneo, Sumatra, Java, and Mindoro, Philippines.

Of our illustrations on Plate 363, figs. 3, 3a, b, are from two males, and fig. 3c from a female; all from Burma.

**DUCAPA FLAVOBRUNNEA** (Plate 363, fig. 4, ♂).

*Paduca flavobrunnea*, Grose-Smith, Annals and Mag. Nat. Hist. 1887, p. 266.

MALE.—Upperside pale olivescient fuliginous-brown, the outer margins darker, the base thickly irrorated with pale yellowish-ochreous scales. *Forewing* with the yellowish-ochreous streaks of modified scales along each side of the two radial veinlets less distinctly defined than in *fasciata*; the two upper-discal pale ochreous spots, the lower-discal band, and the outer-discal row of spots, disposed as in *fasciata*, but all being more or less confluent, the posterior black spot small; the submarginal dentate lunules distinct, but with their inner points slightly touching the outer-discal spots; outer marginal lunular line slightly defined. *Hindwing* with similar but less distinct ochreous streaks of modified scales along the subcostals than in *fasciata*; the pale ochreous inner-discal band and the outer-discal band divided only by a dusky fascia, traversed by the medial-discal black spots as in *fasciata*, these spots being very prominent; submarginal ochreous lunules distinct; marginal line slender. Underside paler than in *fasciata*; with all the markings the same, but more faintly defined; the black spots being smaller.

Expanse, ♂  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Upper Tenasserim.

This may probably be the *dry-season* form of *D. fasciata*.

DISTRIBUTION.—The type-specimen, described by Mr. Grose-Smith, was taken by Col. C. H. E. Adamson on the 4th February, 1881, at Tounggya Sekkan, in the Moulmain District. A male from Moolai, Upper Tenasserim, taken in February, 1892, by Capt. C. T. Bingham, is in Col. C. Swinhoe's collection. A male, also from Upper Tenasserim, taken by Mr. Hawxwell, is in Mr. Grose-Smith's collection.

Our illustration of this species on Plate 363, fig. 4, is taken from the type-specimen in the collection of Col. C. H. E. Adamson.

AUSTRO-MALAYAN SPECIES.—*Ducapa Satyrina* (Cirrochroa Satyrina, Felder, Reise Nov. Lep. iii. p. 389). *Habitat.* Celebes.—*Ducapa Myrsa*, Grose-Smith, Ann. Nat. Hist. 1887, p. 267. *Habitat.* Celebes.—*Ducapa Sibylla* (Cirrochroa Sibylla, Röber, C. B. Iris, 1887, p. 191, pl. 7, fig. 7). *Habitat.* Celebes.—*Ducapa Similiana* (Cirrochroa Similiana, Röber, C. B. Iris, 1887, p. 191, pl. 7, fig. 8). *Habitat.* Bankei.—*Ducapa Felderi* (Cirrochroa Felderi, Kirsch, Mittl. Mus. Dresden, 1877, p. 123, pl. 6, figs. 3, 3a). *Habitat.* New Guinea.

Genus CIRROCHROA.

*Cirrochroa*, Doubleday, Gen. of Diurnal Lep. i. p. 157 (1848). Moore, Lep. of Ceylon, i. p. 62 (1881).

Distant, Rhop. Malay. p. 177 (1882). de Nicéville, Butt. of India, ii. p. 107 (1886). Semper, Reise. Phil. Lep. p. 107 (1888).

IMAGO.—Wings ample, short, broad. *Forewing* triangular; costa arched from

the base, apex slightly truncate; exterior margin oblique, very slightly uneven, posterior angle obtuse, posterior margin slightly recurved; costal vein extending to half the margin; first subcostal branch emitted at some distance before end of the cell, second branch at its end, third branch at one-half beyond the cell, fourth at about one-fifth beyond the third; cell short, broad; discocellulars inwardly-oblique; upper discocellular short, middle discocellular concave, lower long and concave posteriorly; two upper median branches emitted at a short distance beyond lower end of the cell; submedian vein recurved. *Hindwing* short, broad; apex slightly angular; exterior margin convex, very slightly scalloped and somewhat angular at end of the upper median veinlet; costal vein extending to the apex; precostal vein short, almost straight; radial emitted from subcostal branch opposite lower median veinlet; cell open; two upper median branches emitted at considerable distance beyond; submedian recurved; internal vein much curved from the base. *Body* moderately stout; thorax and base of abdomen hairy; palpi ascending, scaly, second joint hairy above, setose beneath, third joint short, slender, almost acicular; forelegs of male short, slender, finely hairy; forelegs of female longer, slender, scaly above, femur finely hairy beneath, tibia and tarsus slightly hairy at the side and beneath, tarsal spines stout; antennæ with a gradually formed slender club; eyes naked.

TYPE.—C. Aoris.

LARVA.—[Lanka.] Cylindrical. Segments with two dorsal rows of long delicate branched-spines, and two lateral rows of shorter spines; a similar spine projecting on each side of head from second segment.

PUPA.—Suspended by tail, but in a horizontal position. With dorsal lengthened tubercles and two longer tubercular processes projecting from front of thorax; head cleft.

#### CIRROCHROA AORIS.

*Cirrochroa Aoris*, Doubleday, Gen. D. Lep. i. p. 157, pl. 21, fig. 2, ♂ (1847-8). Westwood, Trans. Ent. Soc. Lond. 1880, p. 113, pl. 2 (*hermaphrodites*). de Nicéville, Butt of India, ii. p. 109 (1886).

*Wet-season form* (Plate 364, fig 1, 1a, ♂, 1b, c, ♀).

IMAGO.—Male. Upperside bright fulvous; basal areas slightly powdered with fuscous scales; veins discally black lined. *Forewing* with the apex truncated; discocellular veinlet edged by a slightly-defined slender blackish line on each side; a transverse inner-discal more or less distinct blackish recurved slender sinuous line; a discal series of very indistinct or obsolescent dusky rounded diffused spots which are most obsolescent, or obsolete, anteriorly; followed by an inner submarginal very indistinct or obsolescent slender sinuous line, an outer submarginal distinct blackish sinuous line, and a marginal straight line, the two latter merging anteriorly and



forming a blackish apical border. *Hindwing* crossed by a blackish slender inner-discal sinuous line bordered outwardly at the costal end by a broad white patch; a discal row of six black rounded spots, one in each interspace except the discoidal; followed by two submarginal engrailed lines, and a less defined marginal nearly straight line. *Underside*. Both wings much paler and duller ochreous-yellow; all the markings, as on upperside, much obliterated. Both wings with a palely defined subbasal streak; the inner-discal sinuous line broadly outwardly-bordered by a lilacine-whitish fascia having a straight even outer edge, the inner sinuous edge being also bordered by a more or less indistinctly defined parallel sinuously-lunular fascia of darker ochreous than the basal ground-colour; the indistinct submarginal and marginal lunular lines inwardly-bordered by whitish lunules; discal black spots on hindwing smaller than on upperside; apical lunules whitish. *Body* and palpi above olivescens-ochreous; beneath and legs pale ochreous; antennæ black.

*Female*. Upperside olivescens brownish-fulvous or darker fulvous-brown; markings as in male, but broader and more sharply defined; the inner-discal sinuous line outwardly bordered, and the submarginal lines interspaced with dull white or paler ochreous than the ground-colour. *Underside* pale dull ochreous, paler than in male, washed with pale violaceous; markings the same, those on the outer border more obscure, the inner more distinct.

Expanse, ♂ ♀  $3\frac{4}{10}$  to  $3\frac{6}{10}$  inches.

*Dry-season form* (Plate 364, fig. 1, d, e, ♂ ♀).

*Cirrochroa Jiraria*, Swinhoe, Trans. Entom. Soc. Lond. 1893, p. 281.

*Male*. Smaller than wet-season form. Upperside. Ground-colour slightly paler; markings similar, but either more or less ill-defined, or on the forewing, the discal sinuous line is absent or slightly apparent at costal end, and on the hindwing the outer submarginal and marginal line is obsolescent. *Underside* paler than in wet-season form; all the markings obscure or obsolescent; the discal transverse fascia of the same tint as the ground-colour, or very slightly paler.

*Female*. Upperside of a uniformly paler olivescens brownish-fulvous than in wet-season form. *Underside* also uniformly paler than in wet-season form; the discal transverse fascia of the same tint as the ground-colour.

Expanse, ♂  $2\frac{8}{10}$  to 3, ♀  $3\frac{4}{10}$  inches.

*HABITAT*.—Sikkim; Bhotan; Upper Assam; Cachar; Silhet; Khasia and Naga Hills.

*DISTRIBUTION*.—"This is one of the commonest species of the genus. It is met with in Sikkim up to about 6000 feet elevation, from April to December, and occurs equally common in the Hills to the Eastwards as far as Sibsagar in Upper Assam" (de Nicéville, *l.c.*).

**CIRROCHROA ABNORMIS** (Plate 365, fig. 1, 1a, ♂).

*Cirrochroa abnormis*, Moore, Journ. Asiatic Soc. Bengal, 1884, p. 19. de Nicéville, Butt. of India, ii. p. 110 (1886).

IMAGO.—Male. Upperside bright fulvous. *Forewing* with the apex slightly truncate; a transverse medial-discal black sinuous band, which is broadest at the costal end, a narrower submarginal sinuous line, and a nearly straight marginal line; the interspace from the submarginal band and outer edge of the wing being suffused with black towards the apex; an indistinct dusky streak at end of the cell. *Hindwing* with a medial-discal transverse angulated black lunular band, which is broadest at the costal end; a submarginal lunular line, and a slender, nearly straight marginal line; a medial-discal row of minute black spots. Underside brownish-ochreous; a transverse medial-discal slightly purpurescent band with waved suffused dusky lunular inner-edge and slender almost straight outer-edge, the band being quite narrow where it crosses from front to hindwing, and is broadly dilated at the costal end on forewing and at anal angle on hindwing; contiguous to the inner-edge of the band is a similar dusky suffused lunular fascia, the interspace being of a slight pale yellowish-ochreous colour; at end of each cell is a dusky double lunular mark, a similar double lunular waved line also extends from middle of the cell on forewing to below the cell on the hindwing; outer border of both wings traversed by faint traces of a yellowish-ochreous submarginal lunular band; on the forewing is a conspicuous lilacine-white apical patch, and on the hindwing is a row of very small black transverse medial-discal dots.

Expanse,  $2\frac{2}{10}$  inches.

HABITAT.—Darjiling.

NOTE.—The type-specimen, in our own collection, is the only example we have seen.

**CIRROCHROA OLIVACEA** (Plate 365, fig. 2, 2a, ♂, 2b, c, ♀).

*Cirrochroa olivacea*, de Nicéville, Butt. of India, ii. p. 110, pl. 24, fig. 111, ♀ (1886).

IMAGO.—Male. Upperside bright fulvous, veins discally defined with black; basal area dusky fulvous. *Forewing* truncate at the apex; discocellular veinlet black lined on both sides; an inner-discal irregular blackish line becoming obsolete posteriorly and is widest on the costa; the outer margin, especially at the apex, broadly black, decreasing hindward and includes two or three fulvous lunules from the lower angle, and sometimes two or three small spots at the apex. *Hindwing* with the usual quadrate pale costal spot; crossed by a slightly-defined black slender inner-discal wavy line, a discal row of six black spots, two submarginal sinuous

lines, and a marginal straight line, the inner line more or less obsolescent anteriorly. Underside opalescent-buff, variable in depth of shade. Both wings with a paler glossy discal band, broadest on forewing and widening to the costa, narrowing and of nearly equal width throughout on the hindwing, its outer-edge defined by a prominent straight fine purple line, its inner-edge by an irregular wavy brown, fulvous-bordered line; subbasal and discocellular line and outer markings obscure; the marginal lunular lines fulvous; the discal black spots on hindwing small; a whitish apical patch on forewing. Body and palpi above olivescens-brown; beneath pale ochreous, antennæ black.

Female. Upperside dark olive fulvous-brown; all the markings darker and more prominent than in male. *Forewing* with a broad discal pale fulvescent-yellow band, the outer dark edge of the discal band on underside being visible; inner edge of the band sharply defined by the black sinuous discal line, its outer edge diffusedly merging into the broad black margin. *Hindwing* with the costal white spot prominently and narrowly descending to lower subcostal; discal row of black spots smaller; submarginal lines distinct; marginal line diffused. Underside purpurecent-grey; markings as in male, the discal band and apical patch glossy greyish-white.

Expanse, ♂  $2\frac{6}{10}$  to 3, ♀ 3 to  $3\frac{2}{10}$  inches.

HABITAT.—Burma; Upper Tenasserim.

DISTRIBUTION.—Specimens of both sexes were taken in the Karen Hills in August, September and October, by Signor L. Fea. Mr. R. Roberts, C.E., obtained it in the Upper Mekong, Shan States, Siam. Col. C. H. E. Adamson records "numerous males and one female, taken in Tenasserim, in March and April" (List 1897, 21). A male, from the Donat Range, Upper Tenasserim, is in Mr. H. Grose-Smith's collection.

**CIRROCHROA MITHILA** (Plate 366, fig. 1, 1a, b, c, ♂ ♀ (*Wet-season form*); fig. 1d, e, ♂ ♀ (*Dry-season form*)).

*Cirrochroa Mithila*, Moore, Proc. Zool. Soc. 1872, p. 558, ♂; Anderson's Zool. Res. Yunnan Exp. p. 924 (1878). de Nicéville, Butt. of India, etc., ii. p. 114 (1886).

*Cirrochroa rotundata*, Butler, Trans. Linn. Soc. Zool. 1877, p. 543, ♂. Distant, Rhop. Malay. pp. 181, 447, pl. 10, fig. 10, ♂, pl. 41, fig. 12, ♀ (1883-86). Butler, Ann. Nat. Hist. 1885, p. 303. de Nicéville, Butt. of India, etc., ii. p. 114 (1886).

Male. Upperside of the same shade of fulvous as in *C. Aoris*, brightest in the *wet-season form*; transverse markings on both wings similar to *C. Anjira*, but more slender and less defined, and in the *dry-season form* are more or less obsolescent on the forewing. Underside of various shades of pale testaceous or pale reddish-

testaceous, slightly glossed with violaceous-grey in certain lights. Both wings with a transverse discal broad band, which is more or less faintly defined in the *dry-season* form, either of same shade as the ground-colour, or of a more or less pale glossy violaceous-grey, its inner-edge somewhat sinuously defined by a more or less indistinct paler or brighter testaceous lunular line, its outer-edge being even and either faintly or distinctly defined by a dusky-purplish diffused line; beyond is an outer-discal row of pale or bright-bordered dusky spots, which, on the forewing, are dentate and more or less obscure, and on the hindwing are distinct and black; followed by a submarginal, more or less defined, pale or bright testaceous lunular line, which is bordered on both its sides by violaceous-grey lunules. The ground-colour is brightest and the markings most defined in specimens of the *wet-season* form.

Female. Upperside pale brownish-fulvous in the *dry-season* form, darker and brighter brownish-fulvous in the *wet-season* form; markings more distinctly and regularly defined throughout than in male. Underside much paler and duller testaceous or pale olivescens-testaceous, glossed with pale violaceous-grey; markings as in male, but less defined.

Expanse, ♂  $2\frac{3}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{4}{10}$  to 3 inches.

HABITAT.—Sikkim; Assam; Khasias; Lower Bengal; Burma; Tenasserim; Malay Peninsula; Sumatra; Java.

DISTRIBUTION.—“Occurs in Sikkim in the same regions and in the same months as *C. Aoris*, but is much rarer. It is not uncommon at Siveke and East of the Tista River, at low elevations. It has a wide range and has recently been obtained, during the rains, at Bankipur, in Behar” (de Nicéville, Sikk. Gazetteer, 1894, 139). “Mr. J. Rothney (Ent. Mo. Mag. 1864, 82) records a single female [as *Anjira*], taken at Barrackpur, but I have never met with it in Calcutta. I have received a single female from Bholahat in the Malda District” (*id.* J. A. Soc. Beng. 1885, 44). Col. C. H. E. Adamson records it as “common on the beds of streams in Tenasserim and Arakan, in the cold and hot weather” (List of Burmese Butt. 1897, 21). Col. C. Swinhoe has examples from the Thoungyeen Valley, taken by Capt. C. T. Bingham, in March and April.

#### CIRROCHROA ANJIRA (Plate 367, fig. 1, 1a, b, c, ♂ ♀).

*Cirrochroa Anjira*, Moore, Proc. Zool. Soc. Lond. 1877, p. 584. de Nicéville, Butt. of India, ii. p. 115 (1886).

IMAGO.—Male. Upperside brighter and redder-fulvous than in *C. Aoris*; markings similar but more prominent. *Forewing* less falcate, rounded at the apex; subcostal veins only black lined; transverse inner-discal sinuous line comparatively more erect and broken; inner submarginal line much less defined and obsolescent

posteriorly; outer submarginal line more sinuous and of equal distance from outer margin to its apical end. Underside paler and duller reddish-fulvous than in upperside; the transverse discal band and outer sinuous markings more or less prominent and glossy lilacine-grey, with deeper reddish borders; the discal band is more uniformly broader on forewing and narrower on hindwing, and is less sinuous on its inner edge than in *Aoris*; no apical patch on forewing.

Female. Upperside rich fulvous-brown; markings more prominent than in male; the outer border of discal sinuous line and interspace of submarginal lines paler, those on the hindwing being white-bordered at the costal end. Underside much paler than in male; markings similar, glossed with lilacine-grey and edged with fulvous-yellow.

Expanse, ♂  $2\frac{6}{10}$  to 3, ♀  $3\frac{2}{10}$  to  $3\frac{4}{10}$  inches.

HABITAT.—South Andamans.

DISTRIBUTION.—Numerous examples were taken by the late Mr. F. de Roëpstorff, at Port Blair, South Andamans.

#### CIRROCHROA SURYA.

*Cirrochroa Surya*, Moore, Proc. Zool. Soc. Lond. 1878, p. 827. de Nicéville, Butt. of India, ii. p. 112 (1886).

*Wet-season form* (Plate 367, fig. 2, 2a, ♂ ♀).

IMAGO.—Male. Upperside bright fulvous, base slightly fuscous; veins not black lined. *Forewing* with the apex rounded; a slender black discocellular bar, a transverse inner-discal broken sinuous line, which is more or less obsolescent posteriorly; outer margin with a narrow black border having a contiguous prominent anteriorly-confluent submarginal sinuous line, and a much less defined but posteriorly-obsolete inner submarginal line. *Hindwing* with a slightly-defined dusky discocellular bar, a distinct black inner-discal slender waved line with a white outer costal patch; an outer-discal row of six prominent black small round spots; two submarginal sinuous lines, the inner line being less defined and broken, and with its upper angles mostly apparent, followed by an outer marginal more even line. Underside pale dull reddish-testaceous, slightly washed with violaceous-grey. Both wings with a slightly-defined subbasal and discocellular slender redder-testaceous line; a transverse discal glossy violaceous-grey band, its inner edge red and slightly sinuous, its outer edge even and more sharply defined with purplish-grey, the band being broadly dilated to the costa on the forewing, narrow and of nearly equal width on the hindwing; the ordinary markings of outer borders obscurely defined; the black spots on hindwing very small.

Female. Upperside somewhat paler fulvous, the basal areas to the discal line

fuscescent; markings more prominent; the discal line on forewing complete, more sinuous and diffused anteriorly, the marginal band somewhat broader, and the inner submarginal sinuous line well-defined; on the hindwing the inner submarginal line is also well-defined. Underside as in male.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{8}{10}$  inches.

*Dry-season form* (Plate 367, fig. 2, b, c, ♂ ♀).

Male. Upperside somewhat paler than in wet-season form, with all the markings less defined. Underside similar to wet-season form. Female. Upperside with the ground-colour and markings as in male, except that the outer border of forewing is blacker, and the marginal lines on hindwing more distinct. Underside similar to male.

Expanse, ♂ 2, ♀  $2\frac{4}{10}$  inches.

HABITAT.—Upper and Lower Tenasserim.

DISTRIBUTION.—“ Confined to Upper Tenasserim. Dr. J. Anderson took several specimens in the Mergui Archipelago in the cold weather. Captain C. T. Bingham obtained numerous specimens in the Thoungyeen forests and the Donat Range from December to April ” (de Nicéville, *l.c.* 113). Mr. O. Limborg took it on the journey from “ Moulmein to Meetan; at Taoo, 3000 to 5000 feet elevation, in March, and at Moolai 3000 to 6000 feet ” (Moore, P. Z. S. 1878, 827).

#### CIRROCHROA THAIS.

*Papilio Thais*, Fabricius, Mant. Ins. p. 64 (1787); *id.* Ent. Syst. iii. i. p. 149 (1793).

*Cirrochroa Thais*, Butler, Catal. Fabr. Lep. B. M. p. 116 (1869). Moore, P. Z. S. 1872, p. 557. de Nicéville, Butt. of India, ii. p. 117 (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 273, larva and pupa.

*Argynnis Thea*, Godart, Enc. Méth. ix. p. 260 (1819).

*Cirrochroa Swinhoei*, Butler, Proc. Zool. Soc. Lond. 1881, p. 604, ♀. de Nicéville, Butt. of India, ii. p. 118 (1886). Hampson, Journ. As. Soc. Bengal, 1888, 353.

*Wet-season form* (Plate 368, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside rich bright fulvous, somewhat deepest basally. Forewing with a slender dusky-lined discocellular streak, a transverse discal more or less prominent black sinuous interrupted line, its anterior portions from upper median dilated and bent inward; two submarginal sinuous lines, the inner dilating broadly inward to the costa, the outer partly merged into the black of outer border. Hindwing crossed by a more or less prominent black inner-discal slender broken line, anteriorly bordered by an outer costal quadrate white patch, followed by a medial

row of black spots, two submarginal sinuous lines and a marginal even line. Under-side. Ground-colour of various shades of reddish-ochreous washed with pale violaceous-grey; subbasal line dusky brown; transverse discal band white or violaceous-grey, dilated anteriorly, its inner-edge brown-lined and more or less deeply sinuous or broken up into dentate portions, its outer-edge being straight and unlined; followed by an outer-discal series of very obscure dusky dentate marks on the forewing, and a row of small black spots on hindwing, and submarginal lunular lines of the ground-colour bordered by violaceous-grey.

Female. Forewing more falcate at the apex. Upperside paler than in male, darker basally; markings similar. Underside olivescient greyish-ochreous or pale brownish-ochreous, washed with violaceous-grey; markings similar to male; the discal band generally prominently edged on both sides by a dark purple-grey line; the discal row of black spots on hindwing very small.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{2}{10}$  to 3 inches.

*Dry-season form* (Plate 368, fig. 1d, e, f, ♂; 1g, h, ♀).

*Cirrochroa relata*, de Nicéville, Butt. of India, ii. p. 116, ♂ ♀ (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 273, larva.

Male. Upperside slightly paler than in wet-season form; all the markings comparatively less prominent. Underside paler and a duller reddish-ochreous, the subbasal and outer markings obscure, the discal band on both wings entire throughout its course, and either of the same shade as the ground-colour or white, its inner edge being very slightly sinuous, and not broken up into dentate portions as in wet-season form.

Female. Upperside also slightly paler than in wet-season form, and the markings less prominent. Underside paler greyish-ochreous than in wet-season form; subbasal and outer markings similar; the discal band entire, as in male, white.

Expanse, ♂  $2\frac{4}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{6}{10}$  to  $3\frac{2}{10}$  inches.

HABITAT.—South India.

LARVA AND PUPA.—“In colour, the many larvæ we found were uniformly black, with an oily-gloss, except the head and last segment, which were light brown. The pupa was almost white on the wing-cases, yellow elsewhere, with numerous minute black spots, suspended in a horizontal position, bearing two dorsal series of recurved spines, and pairs of similar, but longer, spines springing from the margins of the wing-cases, the thorax and the head. We found these in July, August, and September on a common tree, *Hydnocarpus Wightiana*, in Karwar. Though the tree was usually surrounded by butterflies laying eggs, it was often difficult to get larvæ. They appeared to resort to the topmost tender shoots, and dropped to the ground

on the least alarm. In captivity they were very troublesome, running about incessantly in indecent haste and often refusing to eat. Many, moreover, were destroyed by a small ichneumon" (Davidson and Aitken, *l.c.*).

DISTRIBUTION AND HABITS.—Messrs. Davidson and Aitken record it as "very common in the North Kanara District, in forest, everywhere and at all seasons, restlessly flitting about from tree to tree, like *Cupha* and *Atella*, and alighting frequently with wings half open or in motion" (Journ. Bombay N. H. Soc. 1896, 252). Mr. L. de Nicéville records it from "N. Kanara, Calicut, Nilgiris, the Wynaad, and Travancore" (Butt. Ind. ii. 117, 118). Mr. G. F. Hampson found it on the "Nilgiris, at 3000 to 6000 feet elevation. Commoner on the Southern than on the Northern Slopes" (Journ. As. Soc. Bengal, 1888, 353). We possess examples of the wet-season form from Koonoor, Nilgiris; Kallaur, Travancore, 1500 feet, taken in February and April; Trevandrum, April; and from Mynall, 2000 feet, Travancore, April. Also dry-season form from the Nilgiris; Malabar; and Trevandrum.

#### CIRROCHROA LANKA.

*Wet-season form* (Plate 369, fig. 1, larva and pupa; fig. 1a, b, c, d, ♂ ♀).

*Cirrochroa cognata*, Moore, Lep. of Ceylon, i. p. 64, pl. 32, fig. 3, 3a, ♂, larva and pupa (1881). de Nicéville, Butt. of India, ii. p. 117 (1886).

*Cirrochroa Thais*, Moore, Lep. Ceylon, i. p. 63, pl. 32, fig. 2, 2a, ♀.

IMAGO.—Male. Upperside uniformly rich fulvous. *Forewing* with a slender black slightly-defined discocellular streak; a transverse inner-discal black sinuous line which is more or less obsolescent hindward, its anterior portions most acute, broadest, and bent inward from the upper median; a broad outer marginal black band traversed by a submarginal or inner row of fulvous acutely-dentate lunules; the anterior interspace between the marginal black band and the discal sinuous line narrower than in the dry-season form. *Hindwing* with a slightly-defined slender black inner-discal broken line bordered outwardly at the costal end by a white patch; followed by a discal row of black rounded spots; two submarginal sinuous lines, the inner line being less defined, and a broader marginal line, which latter mostly extends to the extreme outer-edge. Underside reddish-ochreous, slightly washed with pale violaceous-grey; subbasal line and discocellular streak slightly-defined; crossed by a medial-discal narrow band, which is either violaceous-white or more or less violaceous-grey, or slightly paler than the ground-colour, its inner-edge more or less distinctly defined by a brown sinuous line, which latter is dentate on the forewing; a discal series of obscure dusky dentate marks on forewing; a row of



small black spots on hindwing; and two submarginal obscure violaceous-grey lunular lines.

Female. Upperside slightly paler than in male; markings similar. Underside greyish-ochreous or olivescient greyish-ochreous, washed with violaceous-grey; markings as in male, the discal sinuous band prominent violaceous-white.

Expanse, ♂ 2 to  $2\frac{6}{10}$ , ♀  $2\frac{6}{10}$  to 3 inches.

*Dry-season form* (Plate 369, fig. 1e, f, ♂).

*Cirrochroa Lanka*, Moore, Proc. Zool. Soc. Lond. 1872, p. 557; Lep. of Ceylon, i. p. 63, pl. 32, fig. 4, 4a, ♂ (1881). de Nicéville, Butt. of India, ii. p. 116 (1886).

Male and female. Upperside similar to wet-season form; markings less prominent, the inner-discal sinuous line on forewing less acutely sinuous anteriorly; the anterior interspace between the marginal black band and the discal sinuous line broader. Underside similar to wet form, except that the transverse discal band is broader and entire and glossy violet-grey or white, its inner-edge being almost even.

Expanse,  $2\frac{6}{10}$  to  $2\frac{8}{10}$  inches.

LARVA.—Pale purplish-brown, yellowish beneath; head yellow, spotted in front with black; with two dorsal rows of long delicate branched-spines, and two lateral rows of shorter spines; a similar spine projecting on each side of the head from second segment.

PUPA.—Pale bluish-purple, spotted with black; with lengthened dorsal tubercles and two longer tubercular processes projecting from front of thorax; head cleft.

HABITAT.—Ceylon.

DISTRIBUTION.—“Found in the Western, Central, and Southern Provinces; plains and up to 6000 feet elevation, in forests. Flight moderately rapid; settles on the ground and on bushes; easily captured” (Capt. Hutchison, Notes). “A low country insect, found chiefly in the interior” (F. M. Mackwood, Notes). “Taken at Galle and Kandy” (Capt. Wade).

#### CIRROCHROA NICOBARICA.

*Cirrochroa Nicobarica*, Wood-Mason and de Nicéville, Journ. Asiatic Soc. Bengal, 1881, p. 231; *id.* 1882, p. 16, pl. 3, fig. 5, ♂. de Nicéville, Butt. of India, ii. p. 112 (1886). Doherty, Journ. As. Soc. Bengal, 1886, p. 258, ♀.

*Wet-season form* (Plate 370, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside bright fulvous, the basal area brighter and somewhat

infuscated; veins black lined. *Forewing* with a slightly-defined blackish slender discocellular streak; the costal margin narrowly, the apex broadly, and the outer margin decreasingly fulvescent-black, and with a small patch of similar coloured scales near the posterior angle; the outer margin being traversed by an obsolescent slender fulvous lunular line; before the apex is a short oblique indented pale streak between the two last subcostals, and also a distinct *narrow streak of bright fulvous scales along each side of the last subcostal* extending from its base to half its length. *Hindwing* with a transverse inner-discal black slender line, which is somewhat discontinuous and nearly straight anteriorly, but sinuous posteriorly, and is bordered outwardly at its costal end by a white patch; beyond is a medial-discal row of six rather large rounded black spots, a smaller dentate spot being also sometimes present in the discoidal interspace; followed by two submarginal rather wide lunular lines, and then an outer marginal border. Underside. Both wings paler and duller fulvous, faintly suffused with lilac; with a transverse medial-discal lilacine-whitish band, which is much less defined and widest on the forewing but prominent on the hindwing, its inner-edge being sinuous and its outer-edge nearly straight. *Forewing* also with a subapical oblique short slender raised blackish bar, and two very slightly-defined submarginal lilacine lunular lines, the inner line being broadly diffused. *Hindwing* with a discal row of six black spots, and two submarginal lilacine-whitish lunular lines, the inner line much the broadest and dusky bordered inwardly.

Female. Similar to the male. Upperside somewhat paler fulvous. *Forewing* with the outer border also paler; the fulvous edging to lower subcostal not present. *Hindwing* with the inner-discal line well defined, the discal row of spots somewhat smaller, the submarginal lines also narrower. Underside. Ground-colour paler and duller than in male; markings the same; the discal band somewhat broader and more distinct on the forewing.

Expanse, ♂  $2\frac{4}{10}$ , to  $2\frac{8}{10}$ , ♀  $2\frac{6}{10}$  inches.

*Dry-season form* (Plate 370, fig. 1, d, e, ♂).

Male. Upperside paler than in wet-season form, the outer border of forewing and markings on hindwing less prominently defined; the submarginal lines narrower. Underside somewhat paler, markings similar, but somewhat narrower.

Expanse, 2 to  $\frac{6}{10}$  inches.

HABITAT.—Great and Little Nicobars.

INDO-MALAYAN SPECIES.—*Cirrochroa Clagia* (*Argynnis Clagia*, Godart, Enc. Méth. ix. Suppl. p. 816 (1823). Boisduval, Spéc. Gén. Lep. i. pl. 10, fig. 6 (1836). Distant, Rhop. Malay. p. 179, pl. 17, fig. 7, ♂ (1883). do Nicéville, Journ. As.

Soc. Bengal, 1895, p. 411. *Habitat.* Java; Sumatra; Singapore.—*Cirrochroa Satellitia*, Butler, Cistula Entom. i. p. 9 (1869), *id.* Lep. Exotica, p. 103, pl. 38, fig. 7 (1872). Distant, Rhop. Malay. p. 178, pl. 19, fig. 9, ♂ (1883). *Habitat.* Hong Kong; Borneo; Malay Peninsula.—*Cirrochroa Orissa*, Felder, Wien. Ent. Monats. iv. p. 399 (1860); *id.* Reise Nov. Lep. iii. p. 388, pl. 49, fig. 7, 8 (1866). Wallace, Trans. Ent. Soc. Lond. 1869, p. 340. Distant, Rhop. Malay. p. 178, pl. 10, fig. 9, ♀ (1883). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 411. *Habitat.* Malay Peninsula; Sumatra; Borneo.—*Cirrochroa Bajadeta*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 150, pl. 3a, fig. 3, 3a, ♂ (1857). Distant, Rhop. Malay. p. 179, pl. 19, fig. 1, 2, ♂ ♀ (1883). *Syn.* C. Ravana, Moore, *l.c.* p. 150, ♀ (1857). *Habitat.* Java; Borneo; Malay Peninsula.—*Cirrochroa Calypso*, Wallace, Trans. Ent. Soc. Lond. 1869, p. 339. *Habitat.* Sarawak, Borneo.—*Cirrochroa Malaya*, Felder, Wien. Ent. Monats. iv. p. 399 (1860). Distant, Rhop. Malay. p. 180, pl. 10, fig. 3, 4, ♂ ♀ (1883). *Syn.* C. Johannes, Butler, Proc. Zool. Soc. Lond. 1868, p. 221, pl. 17, fig. 10; *id.* Tr. Linn. Soc. Zool. 1877, p. 543. *Habitat.* Malay Peninsula.—*Cirrochroa Lapaona*, Kheil, Rhop. Nias, p. 20, pl. 2, fig. 7 (1884). *Syn.* C. lunulata, Kheil, *l.c.* p. 21, pl. 2, fig. 8 (1884). *Habitat.* Nias Island.—*Cirrochroa Niasica*, Honrath, Berl. Ent. Zeit. 1892, p. 437. *Habitat.* Nias Island.—*Cirrochroa Emalea* (Argynnis Emalea, Guérin, Delessert's Voy. dans l'Inde, p. 72 (1843). Symphædra Emalea, Distant, Rhop. Malay. p. 114. de Nicéville, Butt. of India, ii. p. 187. *Habitat.* Malay Coast.—*Cirrochroa Psyche*, Staudinger, D. Ent. Zeit. Lep. (1889), p. 45. *Habitat.* Palawan.—*Cirrochroa Tyche*, Felder, Wien. Ent. Monats. 1861, p. 301. Semper, Reis. Phil. Lep. p. 108, pl. 20, figs. 3, 4, 5, ♂ ♀ (1888). *Habitat.* Mindanao.—*Cirrochroa Menones*, Semper, Reis. Phil. Lep. p. 108, pl. 20, figs. 1, 2, ♂ ♀ (1888). *Habitat.* E. Mindanao.

### Genus DRYAS.

*Dryas*, Hübner, Tentamen, Lep. p. 1 (1806). Scudder, Hist. Sketch Gen. Butt. p. 159 (1875).

*Argynnis* (part), Auctorum.

*Argyronome* (part), Hübner, Verz. bek. Schmett. p. 32 (1816).

IMAGO.—Male. *Forewing* elongately triangular; costa slightly arched, apex obtusely rounded, exterior margin oblique and slightly scalloped, posterior margin straight; costal vein extending to three-fifths the margin; first and second subcostal branches emitted near together before end of the cell, the third at less than half beyond the cell, the fourth at nearly three-fifths beyond; discocellulars inwardly-oblique, slightly incurved, upper extremely short, almost obsolete, lower twice the length of the middle; cell long, extending to half the wing; the middle median

branch emitted at fully half before lower end of the cell, lower median at one-third from base of the cell; median veinlets and submedian vein recurved from their base; the *three median branches* for a portion of their length from near their base and the *submedian vein* along its middle conspicuously *branded with a broad lengthened raised streak furnished with androconial scales*, the streak being most prominent on the lower median. *Hindwing* short, broad, conically-ovate; exterior margin convex and well scalloped, anal angle pointed; precostal vein curved, pointed outward; costal vein much arched from above the base, ending at apex; cell closed, very broad across its middle; discocellulars outwardly-oblique, of nearly equal length, both slightly incurved, upper starting from lower subcostal branch at some distance beyond its base; two upper median branches starting together from lower end of the cell. *Body* moderately stout, hairy above; palpi slightly ascending, projecting forward to above vertex, first and second joints scaly laterally and clothed above and in front with long fine setiform hairs, apical joint acicular, scaly; forelegs of male slender, fringed with delicate hairs; forelegs of female scaly, slightly fringed with hairs, tarsal joints minutely spined; antennæ with an abrupt spatulate club.

TYPE.—D. Paphia, Linn.

**DRYAS KAMALA** (Plate 371, fig. 1, 1a, b, ♂ ♀).

*Argynnis Kamala*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 156 (1857); *id.* Proc. Zool. Soc. Lond. 1874, p. 267. de Nicéville, Butt. of India, ii. p. 134 (1886).

*Argynnis Cnidia*, Felder, Reise Novara, Lep. iii. p. 392, pl. 50, fig. 5, 6, ♂ (1867).

IMAGO.—Male. Upperside yellowish-ochreous; basal areas either slightly dusky ochreous, or densely covered with darker olivescens-ochreous-brown scales. Cilia pale ochreous. *Forewing* with all veins black and the *middle and lower median branch* for a portion of their length from the base furnished with *raised androconial scales*; two black waved bars across middle of the cell, a wedge-shaped broader bar beyond and a broad waved bar from upper end of the cell, the two latter bars being obliquely-joined to the black discocellular veinlet; a transverse inner-discal angulated continuous series of large broad irregular-shaped spots, a costal oblique patch beyond; followed by an outer-discal row of spots, of which the three upper are rounded, the third being much the smallest, the lower three somewhat cordate; a submarginal row of smaller and narrower partly-conjoined spots, and then two marginal partly-confluent angulated lines. *Hindwing* with an obscure blackish bar at end of the cell, a transverse inner-discal angulated broken or continuous series of black spots, a discal curved row of rounded spots, a submarginal row of duplex lunular spots, and two marginal angulated lines. Underside. *Forewing* pale

ochreous-yellow; the black cell-marks, inner-discal and lower outer spots as above, the inner-discal being larger and more quadrate; the apical spots green, the submarginal inwardly-bordered by two silvery-white spots, and the outer-discal sometimes by two similar lunules; marginal lines obscure. *Hindwing* glossy golden-green; crossed by an outwardly oblique silvery-white broad broken subbasal and two broken medial-discal bands, followed by an outer-discal continuous macular band, and then a marginal broad lunular band, the portions of the first discal band inwardly edged with black, and of the second and also the two outer bands outwardly edged with black; the area between the two outer silvery bands bearing a series of obscure ferruginous ocellate spots, of which the lower, and sometimes all, have a silvery-white pupil, these ocelli sometimes also being partly encircled by pale ochreous. *Body* and palpi above olivescient brownish-ochreous, beneath ochreous-grey; legs pale ochreous, femora beneath grey; antennæ black above, beneath and tip reddish.

Female. Upperside. Ground-colour paler yellowish-ochreous than in male, the basal area and posterior of forewing, and all but the anterior interspaces and outer submarginal lunules of the hindwing, densely covered with bronzy dusky olive-green scales, or almost the entire ground-colour is even more densely covered with very dusky olive-brown scales, the dusky ochreous interspaces being obscure; the markings are similar to those in the male, but more prominently black. Underside similar to the male; ground-colour of forewing brighter ochreous, or dusky ochreous, and of the hindwing more dusky golden-green.

Expanse, ♂  $2\frac{6}{10}$  to 3, ♀  $2\frac{6}{10}$  to  $2\frac{8}{10}$  inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—“Abundant in the Simla District and Lower Kunawur throughout a tract of 120 miles, at an altitude of 6000 to 10,000 feet, in the summer and autumn months. It affects open glades and the borders of forests, pitching on low shrubs, brambles, and banks of thyme, thistle, scabious heads, etc.” (Capt. A. M. Lang, Proc. Zool. Soc. Lond. 1865, 495). Major H. B. Hellard took it at “Simla and Masuri from June to October” (MS. Notes). Mr. P. W. Mackinnon records it as “very rare in Masuri, but abundant at Nag Tiba, 8000 feet elevation, from May to September; also further in the interior in August” (J. Bombay N. H. S. 1898, 372). Major J. W. Yerbury took “a few specimens at Murree and along the slope of Thundiani, in September” (P. Z. S. 1886, 362). Mr. W. Doherty obtained it at Dhankuri, 10,000 feet elevation, Kumaon” (J. A. S. Beng. 1886, 121). “Fairly common throughout the North-west Himalayas and also in Kashmir. I have seen dozens of males sucking up moisture in damp places on the borders of streams in Kashmir in June. They are also very fond of *Compositæ*” (L. de Nicéville, Indian Agric. 1880).

**DRYAS RUDRA** (Plate 371, fig. 2, 2a, b, ♂ ♀).

*Argynnis Rudra*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 157 (1857); *id.* Proc. Zool. Soc. Lond. 1874, p. 267; Anderson's Zool. Res. Yunnan Exped. p. 92 (1878). de Nicéville, Butt. of India, ii. p. 132, pl. 18, fig. 75, ♂ (1886).

IMAGO.—Male. Upperside bright fulvous, basal areas olivescient fulvous. Cilia pale fulvous. *Forewing* with the *lower median and submedian vein lined with blackish androconial scales*; a black slender reniform mark, then a recurved bar across middle of the cell, and a broad constricted bar at end of the cell; an inner-discal transverse series of five large spots, the upper one divided by the subcostal and upper radial veinlet, the next disposed outwardly beyond, the two next inwardly placed in the median interspaces, the lowest outwardly in the submedian interspace; beyond is a large costal speckled patch; followed by an outer-discal row of round spots, the upper two being small and the fourth still smaller; a submarginal row of somewhat smaller spots decreasing in size upwards, and then a marginal row of either separate or continuous narrow angular marks, and an outer marginal slender line. *Hindwing* with a black bar at end of the cell, an inner-discal angularly disposed series of six spots, an outer-discal curved row of five large rounded spots, and a lower slender curved streak, followed by a submarginal row of somewhat cordate spots, a marginal row of angular marks and a less defined outer marginal slender line. Underside. *Forewing* paler fulvous, the costal edge olivescient, the apical and marginal markings dusky olive-green; the outer-discal spots bordered inwardly by a slightly-defined white lunule; the cell and discal markings as above. *Hindwing* bright olive-green, the abdominal margin bluish-grey; a subbasal transverse broad ferruginous-brown band extending from the costal vein across the cell to submedian vein, its inner edge being even and its outer edge sinuous; a discal narrow irregular glossy violaceous-white band, and a less prominent submarginal ochreous-white catenulated fascia; the medial-discal area bearing a row of obscurely-defined ocellate spots of which the two upper and the fifth are ferruginous-brown with a slight white pupil, the others being bright green and blind; a medial-discal slender irregular wavy ferruginous line also extends from the costal vein and inwardly edges the white band from the radial to the submedian vein.

Female. Upperside as in the male, except that the markings are somewhat broader, and on the forewing a small white dentate spot is present in the basal interspace of the fourth and fifth subcostals. Underside as in the male.

*Body* and palpi above olivescient-fulvous, beneath olivescient-green; legs fulvous, femora beneath grey; antennæ above black, beneath and tip red.

Expanse, ♂ 3, ♀  $3\frac{2}{10}$  inches.

HABITAT.—Assam; Sibsagar; Cherrapunji; Khasias; Upper Burma.

DISTRIBUTION.—“It is fairly common at Shillong in June. Specimens are in the Indian Museum, Calcutta, from Cherrapunji, Sibsagar, and others from Pousee in Upper Burma, also taken in March by Dr. J. Anderson during the Yunnan Expedition” (de Nicéville, *l.c.* 132). “Abounds in the northern plateau of the Khasias from May to August. Taken at Bhamo by Dr. Anderson” (W. S. Atkinson, Notes).

# DRYAS MAJA.

*Papilio Maja*, Cramer, Pap. Exot. i. pl. 25, fig. B, C, ♀ (1775).

*Papilio Pandora*, Denis and Schiff, Wien. Verz. p. 176 (1776). Hübner, Exot. Schmett. i. fig. 71, 72 (1793), *id.* fig. 606-7 (1823).

*Argynnis Pandora*, de Nicéville, Butt. of India, ii. p. 133 (1886).

*Papilio Cynara*, Fabr. Gen. Ins. p. 266 (1776).

IMAGO.—Male. Upperside greenish-fulvous. *Forewing* with two black bars crossing the cell near the middle, another broader pair at its end, with an oblique black line joining them; a discal much angled band, a diffused subcostal spot, a series of seven rounded spots, two submarginal series of oval spots, the outer series touching each other on the interspaces; the *two lower median veinlets* for a portion of their length *clothed with raised modified scales*. *Hindwing* more greenish; a black duplex discocellular line, a discal irregular somewhat lunulated line from the costal veinlet to the lower median veinlet, a series of five round spots beyond, a series of seven submarginal spots, the three anterior rounded, the rest lunular, a marginal series of joined lunules. Underside. *Forewing* rosy-red; the costa, apex broadly and outer margin decreasingly pale yellow; the apical spots, as on upper side, greenish; other markings as above, but more prominent. *Hindwing* deep green; the costal lobe, a spot within from base of precostal along the costal veinlet, a curved spot from the costal veinlet to the point where the first subcostal veinlet is given off, inwardly defined with black, a similar spot towards the end of the cell—all these spots often more or less wanting; a discal irregular somewhat narrow band, inwardly defined with black towards the costa, a series of five minute spots placed on round diffused fulvous patches, and a submarginal narrow line, all silvery.

Female. Upperside darker than in male, all the markings more prominent. Underside also with the markings more prominent, especially the silvery ones on the hindwing. Cilia fulvous.

Expanse, ♂  $2\frac{8}{10}$  to 3, ♀  $3\frac{5}{10}$  inches.

HABITAT.—S.E. Germany; S. Europe; Western Asia; Gilgit.

DISTRIBUTION.—Mr. L. de Nicéville records “a single male, received from Mr. J. F. Duthie, taken by a native botanical collector attached to Colonel Lockhart’s

Mission, probably near Gilgit, on the North-eastern frontier of Kashmir. It has been recorded from Turkestan and from Kouldja" (*l.c.* p. 134).

**DRYAS CHILDRENI** (Plate 372, fig. 1, 1a, b, ♂ ♀).

*Argynnis Childreni*, Gray, Zool. Miscellany, i. p. 33 (1831); *id.* Lep. Ins. of Nepal, p. 11, pl. 11, fig. ♂ (1846). de Nicéville, Butt. of India, ii. p. 132 (1886). Leech, Butt. of China, i. p. 243 (1893).

IMAGO.—Male. Upperside bright rich fulvous, the basal areas deeper olivescens-fulvous. *Forewing* with the *middle* and *lower median* and *submedian* vein along each side from near their base to beyond the middle conspicuously *lined with raised blackish androconial scales*; two black narrow sinuous bars across middle of the cell, a broad bar beyond touching the subcostal but not reaching the median veinlet, and a broader bar at end of the cell, the latter bar being much constricted and sometimes broken in its middle; a transverse inner-discal series of six large spots, the upper three superposed obliquely outward, the second longitudinally oval, the third rounded, the uppermost being cut by the subcostal, the fourth inwardly-disposed in the upper median interspace, large, oval, and vertical in position, the next still more inwardly-disposed in the lower median interspace, much smaller, irregularly oval or subdentate, and placed obliquely outward, the lowest spot outwardly-disposed in the submedian interspace, small and constricted; beyond is an upper-discal large lobate spot between the subcostal and upper radial, above which are some slender subcostal streaks, and below it an incipient small speckled spot, followed by an outer-discal recurved series of seven large rounded spots, a submarginal row of somewhat cordate spots, a marginal angulated lunular line, and then an extreme outer marginal slender line. Cilia fulvous. *Hindwing* with a short narrow black bar crossing upper end of the cell, a transverse inner-discal angular series of six spots, the upper three being somewhat linear, the others irregular-shaped, followed by a medial-discal row of five large rounded decreasing spots, a submarginal row of larger somewhat conical spots, the lowest becoming more lunular, and then a marginal and outer line as on forewing; the outer border, broadly from the lower radial to the anal angle and for a short distance up the abdominal margin, prominently interspaced with rich deep olivescens bluish-grey, the cilia being white. Underside. *Forewing* with the basal two-thirds red, almost crimson in some specimens, the costal border from base to near end pale yellowish-ochreous; an oblique subapical fascia also pale yellowish-ochreous, the apical area being olive-green crossed by two silvery-white lunular streaks extending to the upper median veinlet; other markings as on upperside, but more prominent. *Hindwing* rich shining ochreous-green, crossed by a silvery bluish-white, black-edged,



basal, two subbasal and an inner-discal, sinuous bands, their upper ends being broad and their lower very irregularly zigzag and narrow, followed by a similar silvery-white medial-discal sinuous broad continuous band, then a slender submarginal sinuous line and marginal band traversed by a fine black line, a similar black line along the margin; between the medial-discal band and submarginal sinuous line is a series of very obscure dusky speckled spots with ochreous centres. *Body* and head above thickly clothed with fulvous hairs; palpi above fulvous, beneath greyish-white, tip black; legs fulvous, femora beneath greyish-white; antennæ black above, reddish beneath, tip red.

**Female.** Upperside. Ground-colour duller than in male, being of a more dusky ochreous instead of rich fulvous; black markings the same, but broader, except that there are no raised scales on the medians and submedian; the forewing also having a very small black speckled spot below the cell in the submedian interspace, and an outer spot below the submedian; the hindwing also having the olivescient bluish-grey outer area extending more broadly inward on the disc and up the anterior border. Underside as in the male.

Expanse, ♂  $3\frac{1}{10}$  to  $3\frac{1}{10}$ , ♀  $3\frac{1}{10}$  to 4 inches.

**HABITAT.**—Eastern Himalayas; Nepal; Sikkim; Assam; Khasias; Naga Hills; Upper Burma; W. and C. China.

**DISTRIBUTION.**—"Occurs in Nepal, Sikkim, Shillong, the Khasia Hills, and Manipur, and it was obtained by the Yunnan Expedition" (de Nicéville, Butt. India, ii. 133). Mr. W. Doherty took it in the Naga Hills, 5000 to 8000 feet elevation, in July and August. In Sikkim it "occurs commonly at Tonglo, 9000 to 12,000 feet elevation, about Midsummer" (*id.* Sikkim Gaz. 1894, 139). "Mr. Otto Möller notes the occurrence of this species in Sikkim at 3000 to 4000 feet elevation, but I have only seen it rarely on Tonglo and the Singalelah Range in open flowery places in the forest, where it settled on flower-heads, at 9000 to 12,000 feet. It occurs from June to October" (H. J. Elwes, Tr. Ent. Soc. 1888, 349). Dr. N. Manders obtained specimens at "Bernardmyo, 7000 feet elevation, Shan States, Burma" (Tr. Ent. Soc. 1890, 523). It also occurs in Western, Central and Eastern China. Mr. J. J. Walker, R.N., obtained it at Hong Kong (Tr. Ent. Soc. 1895, 456).

**DRYAS SAKONTALA** (Plate 372, fig. 2, 2a, ♂ ♀).

*Argynnis Sakontala*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 439, pl. 12, ♂ ♀ (1844).

**IMAGO.**—Smaller than typical *Childreni*. Male and female. Upperside much paler, and of an olivescient yellowish-ochreous colour; black markings similar but less prominent; the olivescient bluish-grey lower border of the hindwing more restricted to the margin, especially in the male. Underside similar to *Childreni*.

Expanse, ♂ 3 to 3 $\frac{2}{10}$ , ♀ 3 to 3 $\frac{4}{10}$  inches.

HABITAT.—West Himalayas.

DISTRIBUTION.—“Rarer, in the Western Himalayas, than *A. Kamala*, frequenting grassy slopes near woods, open copses, and gardens at 7000 to 10,000 feet elevation. Flight bold and very fast; affects *Compositæ* and *Cruciferae*” (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 132). Major H. B. Hellard took it at “Ooramboo Valley, Kashmir, in June” (MS. Notes). Mr. W. Doherty obtained it at “Naini Tal, Khati, 6000 to 8500 feet, Kumaon” (J. As. Soc. Beng. 1886, 121). Mr. L. de Nicéville took it in “Kashmir, Kulu, and Simla; it occurs also in Masuri and Kumaon” (Butt. Ind. ii. 133). “This is the most handsome and has the strongest flight of all the Himalayan Fritillaries. It first appears about June, and worn specimens may still linger on till late in September. It is very partial to thistles, and can be easily taken when busily engaged in sucking up the honey of these flowers” (*id.* Indian Agriculturist, 1880). Mr. P. W. Mackinnon records it as “rare in Masuri, but very numerous in the interior from May to September” (J. Bombay N. H. S. 1898, 372).

CHINA AND JAPAN SPECIES.—*Dryas Phaphoides* (Argynnis Phaphoides, Butler, Ann. Nat. Hist. 1881, p. 134. Leech, Butt. of China, i. p. 239, pl. 23, fig. 2 (1893). *Habitat.* China; Corea; Japan.—*Dryas Japonica* (Argynnis Japonica, Ménétr. Catal. Lep. Acad. Petr. ii. p. 102, pl. 10, fig. 3 (1857). Leech, *l.c.* p. 237. *Habitat.* China; Corea; Japan.—*Dryas Anadyomene* (Argynnis Anadyomene, Felder, Ent. Monats. vi. p. 25 (1861). Pryer, Rhop. Nippon, p. 28, pl. 8, fig. 2 (1889). Leech, *l.c.* p. 240, pl. 23, fig. 1, ♂ (1893). *Syn.* Arg. Ella, Bremer, Lep. Ost. Sib. p. 94, pl. 8, fig. 1 (1864). Arg. Midas. Butler, Journ. Linn. Soc. Zool. ix. p. 53, ♂ (1866). *Habitat.* China; Corea; Japan.—*Dryas Lysippe* (Arg. Lysippe, Janson, Cist. Entom. ii. p. 154 (1877). Leech, *l.c.* p. 237, pl. 23, fig. 3, 4a, b, ♂ ♀ (1893). *Habitat.* C. and W. China; Japan.—*Dryas Zenobia* (Argynnis Zenobia, Leech, Entom. xxiii. p. 188 (1890); Butt. of China, i. p. 242, pl. 23, fig. 5, 6 (1893). *Syn.* Arg. Penelope, Staudinger, Iris, Dresden, 1891, p. 339. Oberthür, Etud. Ent. xvi. p. 7, pl. 1, fig. 1 (1892). *Habitat.* W. China.

Genus *Damora*, Nordm.—*D. Sagana* (Arg. Sagana, Doubleday, Gen. D. Lep. pl. 24, fig. 1, ♂ (1847). Leech, *l.c.* p. 241. *Syn.* *Damora Paulina*, Nordmann, Bull. Mosc. 1851, 2, p. 440, pl. 11, fig. 1, 2, ♀. Female is a mimic of *Apatura Here*, Feld. *Habitat.* China; Japan.

#### Genus ACIDALIA.

*Aridalia*, Hübner, Verz. bek. Schmett. p. 31 (1816). Moore, Lep. of Ceylon, ii. p. 60 (1881).

*Argynnis* (part), Auctorum.

IMAGO.—Male. Forewing elongatedly-triangular; costa much arched, apex rounded, exterior margin oblique, sinuous, convex below the apex; *middle and*

*lower median branches and submedian vein* from their base for a portion of their length slenderly branched with raised androconial scales; costal vein extending to two-thirds the margin; first and second subcostal branches emitted before end of the cell, third branch at nearly one-half beyond, fourth and fifth at two-thirds beyond; upper discocellular very short, second deeply concave, lower slightly concave; middle median branch emitted at nearly one-third before lower end of the cell, lower median from two-thirds before its end; submedian vein recurved. *Hindwing* short, broad; costal margin very broadly lobed at the base; precostal vein curved; costal vein much arched from the base; first subcostal branch emitted at nearly one-half before upper end of the cell; discocellulars of equal length, upper curved very obliquely outward, lower slightly curved; two upper median branches from lower end of the cell, lower median from one-third before the end; submedian and internal vein slightly recurved at the base. *Body* robust; palpi ascending, finely pilose, second joint long, extending to top of head, third joint short, pointed, naked; legs slender; antennæ with a short spatular club.

TYPE.—*A. Hyperbius* [Niphe].

NOTE.—Mr. L. de Nicéville writes, "The male of *A. Niphe* is not strikingly different from other species of the genus *Argynnis*, but the female with the apical half of the forewing on the upper side deep purple crossed by a broad white band is an entirely unique animal. There is no doubt that this distinctive type of coloration has been acquired by the female as a protection against its enemies, as, on the wing, that sex passes very well for a *Danaïs* (*Limnas*) *Chrysippus*, which is a highly protected butterfly. In Java the female has assumed a slightly different dress, the ground-colour of the upperside being considerably deeper and richer than the Indian form, the butterfly mimicking *D. (L.) Bataviana*, which is a dark red geographical race of *D. Chrysippus*. This race has been named *Javanica*, by Oberthür. But the most wonderful feature of all, with regard to *A. Niphe*, is the occurrence in South India (Trichinopoly and the high range of hills in Travancore) and in Australia of two geographical races which have females, to all intents and purposes, similar to their respective males, the distinctive purple ground and white band of the forewing having entirely disappeared. The two species (as they have been called) though it is perhaps better to treat them as geographical races, may be distinguishable the one from the other. I have only seen the Indian form, which has been named *Castetsi* by Oberthür; the Australian form being called *inconstans*, by Butler. It is highly probable that this form represents the ancestral (atavistic) one of the species, and the typical *A. Niphe* a more recent development. It is a matter for interesting speculation, why in all Asia, the form found in a most limited area in extreme Southern India should alone have remained unaltered, while the form occurring over the immensely wide area enclosed between extreme Eastern Africa

and extreme Western Asia should have shown such great sexual divergence in coloration and markings. There are two other points which I may mention. One is the curious fact that *A. Niphe* does not exist, apparently, in Southern Burma and the Malay Peninsula, though it is found to the North in Upper Burma, and to the South in Sumatra. The other point, is the presence in the males of both forms (typical *Niphe* and *Castetsi*) occurring in South India, on the upperside of the forewing, of raised modified scales (androconia) along a portion of the first median nervule. This feature is, moreover, absent from Ceylon specimens, which is again, an extraordinary fact, Ceylon being so close to India, divided from it only by a narrow shallow strait. I may also note that were sufficient material available from South India, it would probably be found that typical *Niphe* and *Castetsi* merge into one another, as I possess a female of the former from the Nilgiri Hills, which have the purple area indistinct and the white bar narrow of the forewing on the upperside, showing by the partial obsolescence of these especial features a distinct approach to the ancestral form, as I am inclined to believe *A. Castetsi* and *A. inconstans* to be" (Journ. Bombay N. H. Soc. 1893, 153).

**ACIDALIA HYPERBIUS** (Plate 373, fig. 1, 1a, b, ♂ ♀).

*Papilio Hyperbius*, Johanssen, Amæn. Acad. vi. p. 408, ♀ (1764).

*Argynnis Hyperbius*, de Nicéville, Journ. Asiatic Soc. Bengal, 1899, p. 194.

*Papilio Niphe*, Linnaeus, Syst. Nat. xii. ed. i. pt. 2, p. 785, ♀ (1767). Drury, Ill. Exot. Ent. i. pl. 6, fig. 1, ♀ (1770). Cramer, Pap. Exot. i. pl. 14, fig. D, E, ♂, B, C, ♀ (1775). Herbst, Pap. pl. 254, fig. 3, 4 (1798).

*Acidalia Niphe*, Hübner, Verz. bek. Schmett. p. 13 (1816).

*Argynnis Niphe*, Godart, Encyc. Méth. ix. p. 261 (1819). Kollar, Hügel's Kaschmir, iv. pt. 2, p. 440, pl. 13, fig. 1, 2, ♂ (1844). de Nicéville, Butt. of India, ii. p. 131 (1886), *id.* Journ. Asiatic Soc. Bengal, 1895, p. 8, pl. 3, fig. 1, 2, ♂ ♀. Leech, Proc. Zool. Soc. Lond. 1887, p. 422, *id.* Butt. of China, i. p. 243 (1893). Semper, Reis. Phil. Lep. p. 127 (1888).

*Papilio Argyrus*, Sparrman, Amæn. Acad. vii. p. 502 (1768).

*Papilio Argynnis*, Drury, Ill. Exot. Ent. i. pl. 6, fig. 2, ♂ (1770). Herbst, Pap. pl. 254, fig. 5, 6, ♂ (1798).

*Papilio Tigris*, Goeze, Ent. Beytr. iii. i. p. 368, ♂ (1779).

*Argynnis Aruna*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 156, pl. 3a, fig. 4, ♂ (1857), *aberration*.

IMAGO.—Male. Upperside bright rich yellowish-ochreous, basal areas slightly tinged with dusky olivescence-ochreous. Cilia pale ochreous alternated with black. Forewing with a black short oblique subbasal cell-bar, two slender medial cross-bars, an outer curved broad bar, and an irregular lobate-shaped discocellular bar; an inner-discal transverse series of large somewhat quadrate spots, the three upper disposed obliquely outward and the two lower obliquely inward, and the lowest outward; a much smaller and somewhat dentate spot also present in the submedian interspace

below the cell; beyond is a large subapical costal triangular spot, an outer-discal row of six round spots of which the upper third and the sixth are very small; followed by a submarginal row of dentate spots, a marginal row of smaller and narrower dentate spots, and then a slender outer marginal line. *Hindwing* with an obscure black short subbasal cell-bar and a bar above the cell, a prominent black middle cell-bar and a short discocellular bar; an inner-discal transverse curved zigzag series of seven spots the upper three or four being narrow, beyond which is a medial-discal row of five rounded spots, a submarginal row of large more or less conical-shaped spots, the lower three slightly conjoined, followed by a marginal black border traversed by a row of slender lunules, the upper three or four being ochreous, the lower pale blue, the lunular interspace between the lower submarginal spot and outer marginal band being also pale blue. *Underside*. *Forewing* with the basal two-thirds reddish-ochreous, apical third pale yellow with its markings, as upperside, confluent and olive-brown; cell and discal black markings as above. *Hindwing*. Ground-colour pale yellow or pale olivescient-yellow; crossed by slender black subbasal bars and a medial-discal zigzag series of bars transversely interspaced with rich olive-brown and bordered with glossy pearly-white lunules; the outer discal row of round spots and the submarginal conical spots being also rich olive-brown, the outer-discal spots each also having a pearly-white central dot, and the submarginal spots outwardly edged by a similar white lunular-bordered black inner marginal line. *Body* and palpi above rich olivescient-ochreous, beneath and legs pale yellowish-ochreous; middle and hind femora and tibiæ whitish beneath; antennæ blackish above, beneath and tip ochreous.

*Female*. Upperside basal half of the forewing and entire hindwing rich brownish-ochreous, basally tinged with olivescient; black markings as in male, but somewhat larger. *Forewing* with the ground-colour of apical half purplish blue-black, traversed by an oblique subapical broad white band, bluish-white apical spots, submarginal row of lunules and marginal slender lunular line. *Hindwing* with the blue-black submarginal spots and outer marginal band more or less confluent, and traversed by two series of slender blue lunules. *Underside* similar to the male, except that the forewing has the subapical oblique white band, which latter also has its inner-bordering black spots interspaced with purple-black.

Expanse, ♂  $2\frac{6}{10}$  to  $3\frac{1}{10}$ , ♀ 3 to  $3\frac{6}{10}$  inches.

*LARVA*.—"Head and legs black; body black, this colour almost obscured by orange-tawny markings. A broad orange-tawny dorsal stripe. Four straight horizontal simple black spines on head; spines on pectoral segments black, on abdominal segments pink, tipped with black, on caudal segments pink, faintly black tipped."

*PUCHA*.—"Head and wing-cases pale red; ten pale metallic spots on the back;

abdomen dark pink; spines faintly black tipped. The head ends in two well-separated blunt points; a pair of spines anteriorly, another pair in the middle, and a third smallest pair posteriorly on the thorax, the latter being hunched and keeled; on the abdominal segments are eight pairs of spines, the third anterior pair the largest" (de Nicéville, Butt. Ind. ii. 131).

HABITAT.—Western and Eastern Himalayas; Oudh; Assam; Khasias; Upper Burma; W. and S. China; Hong Kong; Formosa; Japan.

DISTRIBUTION AND HABITS.—"In India it is found throughout the outer ranges of the Himalayas, also in Assam and Burma. I have taken it at Agra in the winter" (de Nicéville, *l.c.* 131). It occurs again in Bombay. "This insect is apparently double brooded, as I took small but perfect specimens at Jutogh near Simla, in April. It has a second brood, which is by far the most plentiful, about June. I have met with it only on the tops of bare hills, flying backwards and forwards and occasionally settling, and then baffling with the wind that is generally rampant in such places. The females are very much scarcer than the males" (*id.* Indian Agric. 1880). Major J. W. Yerbury took it at Cambelpore in May, and at Murree in September" (P. Z. S. 1886, 361). Capt. A. M. Lang found it "tolerably abundant in certain localities in the N. Western Himalayas, at 6000 to 8000 feet elevation. The males seem much more abundant than the females" (Ent. Mo. Mag. 1864, 131). Major H. B. Hellard took it at Simla, Masuri, and Pangi in Busahir, from June to October" (MS. Notes). Mr. W. Doherty found it in the "Lower Himalayan region, Kumaon, from the Kali Valley 2500 feet elevation, to Almora and above Pithoragarh, 6000 feet" (J. A. Soc. Beng. 1886, 121). Mr. P. W. Mackinnon records it as "very common in Masuri and the Dun, from April to November" (J. Bombay N. H. S. 1898, 372). Mr. L. de Nicéville says it "occurs in Sikkim almost in every month of the year, most usually at an elevation of 4000 feet. I have bred the larva at Tukvar, where it was found feeding on wild violets amongst the tea bushes" (Sikkim Gaz. 1894, 139). Mr. H. J. Elwes states that it is "a common species in Sikkim up to 5000 feet, but mostly found in tea-gardens, or places where the forest has been cleared. Occurs from March to December" (Tr. Ent. Soc. 1888, 349). Mr. de Nicéville describes and figures a gynandromorphous example reared by Mrs. S. Robson in March, 1893, at Bankipur, Behar, N. India (J. Bombay N. H. Soc. 1895, p. 8, pl. 3, fig. 1, 2). Col. C. Swinhoe "took several examples in Bombay in 1877, but have not observed it since" (P. Z. S. 1885, 128). Mr. J. Betham says "the male has all the characteristics of the typical Fritillary, dashing about in flight and fanning its wings when settled just in the same sharp manner. The female is a more or less close imitation of *Danais Genutia*, and in flight looks very like the butterfly it mimics" (Journ. Bombay N. H. Soc. 1890, 283). Dr. N. Manders records it as "occurring

throughout the Shan States, Burma. Found commonly on the Phwayla Plateau, and less commonly at Fort Stedman" (Tr. Ent. Soc. 1890, 523). Capt. E. Y. Watson took it in the "Chin Hills, in May and June, occurring rarely at 3500 feet and upward" (J. Bombay N. H. S. 1897, 655). It occurs also in W. and S. China, Hong Kong, Formosa, and Japan. Mr. J. J. Walker, R.N., records it as "tolerably common in Hong Kong, frequenting the tops of the hills, and also met with in gardens. The female bears a striking resemblance to *Cethosia Biblis*, as well as to *Danaüs Chrysippus*, when on the wing" (Tr. Ent. Soc. 1895, 455).

LIFE-HISTORY AND HABITS.—"During the cold weather of 1892-3 I was very much surprised to see a female of *A. Niphe* in my garden at Bankipur, Behar. I had never seen this butterfly here before, though I had often caught it at Masuri. Mr. de Nicéville tells us that the food-plant of the larva is usually the wild violet. So far as I could find out, this does not grow in Bankipur, and I, therefore, tried shutting up a female in a cage with a pot of garden Violets, but she did not lay. Very soon after this, I picked up a caterpillar which I found crawling on the ground, in a bed of Pansies. Further search led to the discovery of others on the Pansies. The caterpillar is black, with a broad orange band down the back, and has thorn-like black spines projecting laterally. It keeps itself carefully concealed under the leaves, but it feels the cold during the night, and when the sun gets warm in the morning, it leaves the plant and takes a little promenade on the ground, and frequently lies basking in the sunshine. When it has got comfortably warmed up, it returns to the food-plant with renewed vigour and a keen appetite. This made it easy to find them, and saved one the trouble of hunting under the leaves. Those in the cage behaved in the same way, and always left the plant in the forenoon to lie on the ground and bask in the warm sunshine. The butterflies seem to have preferred the Pansies (*Viola tricolor*) to the Violets (*V. odorata*) because the Violets were in pots, whereas the Pansies were in the ground. I found that a female which refused to lay when caged on a pot of Pansies laid freely when caged over Pansies planted out. She walked about over the plant depositing an egg here and there, sometimes on the leaf, sometimes under it. The eggs are cone-shaped, slightly flattened on the top, and when first laid are pure white, gradually becoming a bluish-green tint. I have also observed a female laying eggs in freedom. She kept partially opening and shutting her wings while she walked along the ground. Then she would get well into a plant, curl her body round the edge of a leaf, and deposit an egg on the under-surface. Then she walked on the ground to another plant, opening and shutting her wings the while; she always laid *under* a leaf, except when she laid on a half-opened one, and then deposited the egg well down and on the upperside. She laid only one egg on each leaf at one time. On one occasion she went back and laid a second egg on a leaf at some distance from the

first. After laying three or four eggs, she would refresh herself with a sip of honey from the flowers, and then begin to lay again. She showed no signs of fear, and on one occasion left the Pansies and sat for some time on my dress. In going from one plant to another, she sometimes dragged her body along the ground as if in the act of laying, but deposited no eggs. She sometimes curled her body round the leaves of *Phlox* that were growing among the Pansies, but seemed to recoil from their rough surface, and left no egg on them. Most of the eggs were laid on the underside of the outer leaves, a few on the stalk of the plant. The larvæ were all black, except the orange-tawny dorsal stripe, and all the spines were black. Presently they went into pupa, suspending themselves by the tail from the top of the cage. When the imago emerged I was surprised and delighted to find it a beautiful *A. Niphe*. Males and females emerged in about equal numbers. One *lusus naturæ*, a male, had one wing as in the ordinary male, and the other as in the female" (Mrs. S. Robson, Journ. Bombay Nat. Hist. Soc. 1893, 151).

**ACIDALIA CASTETSI** (Plate 373, fig. 2, 2a, ♂ ♀).

*Argynnis Niphe*, var. *Castetsi*, Oberthür, Bull. Soc. Ent. France, 1889, p. 235; *id.* Etudes Ent. 1891, p. 9, pl. 1, fig. 1, ♀ (in garb of ♂).

IMAGO.—Male and female. Differs from typical *Hyperbius* (*Niphe*) in the forewing being comparatively shorter and less produced apically. Male. Upperside with similar black markings. *Forewing* with the inner-discal series of spots somewhat narrower, the outer-discal series having the spot above the upper median and also the lower spot larger, the submarginal row of spots are also narrower; the *lower median* veinlet is furnished with a prominent posteriorly recumbent series of raised *androconial scales*, for a portion of its length. *Hindwing* with the outer-discal row of spots somewhat larger and the submarginal narrower. Underside. *Forewing* with the basal area bright reddish-ochreous; markings as above.

Female. Upperside duskier fulvous than in male, with markings similar. Forewing with the subapical oblique white band transversely shorter and narrower than in *Hyperbius*. Underside similar to male, except subapical band on forewing, as above. The type-specimen, described and figured as a female—in the garb of the male—is distinguished from an ordinarily-marked female, by the absence, on the forewing, of the oblique white subapical band, and also of the white apical and outer marginal spots, the ground-colour of these parts being of the usual fulvous colour similar to that in the male.

Expanse, ♂ ♀  $2\frac{6}{10}$  to  $2\frac{8}{10}$  inches.

HABITAT.—South India.

DISTRIBUTION.—The type-specimen is recorded from Trichinopoly. Occurs



also in the Nilgiris and Travancore. Mr. G. F. Hampson records it as being "confined to the Plateau, where it is very common" (J. A. S. Beng. 1888, 354). Mr. H. Ferguson records it as being "found rarely at Pirmerd, Travancore; common on the Hill range, the male more so than the female" (Journ. Bombay N. H. S. 1891, 3).

**ACIDALIA TAPROBANA.**

*Acidalia Niphe*, Moore, Lep. of Ceylon, i. p. 60, pl. 31, fig. 2, 2a, ♂ ♀, 2b, larva and pupa (1881).

IMAGO.—Intermediate between the S. Indian form (*Castetsi*) and typical *Hyperbius*. Male. Upperside with the black markings comparatively larger and broader. On the hindwing, the discocellular bar extends prominently from the median to subcostal veinlet. Female. Upperside with similar larger black markings; the subapical oblique white band on forewing broader than in the S. Indian form.

Expanse, ♂  $2\frac{1}{10}$  to  $2\frac{6}{10}$ , ♀ 3 inches.

LARVA.—Purplish-black, with a dorsal tawny stripe. Head spined; segments with dorsal and lateral rows of red branched-spines.

PUPA.—Head bluntly bifid; thorax hunched and keeled, spined in front; dorsum slightly arched, with pairs of anterior and posterior spines. Pale purplish-black, with subdorsal metallic spots. (Described from figure, *l.c.*)

HABITAT.—Ceylon.

DISTRIBUTION.—"Found in the Hills from 2000 to 6000 feet elevation, in the neighbourhood of waste grass lands and swamps. Larva feeds on Wild Violet" (F. M. Mackwood, MS.). "Very common in the upper and middle districts wherever the Violet is found, on which plant the larva feeds. It is particularly numerous about Newara Eliya and on the Horton Plains, stragglers being occasionally found in the low country. It flies nearly all the year round" (Dr. N. Mauders, Journ. As. Soc. Bengal, 1899, 194).

MALAY AND AUSTRO-MALAY SPECIES.—*Acidalia Javanica* (*Argynnis Javanica*, Oberthür, Bull. Soc. Ent. France, 1899, p. 235. *Habitat.* Java; Sumatra.—*Acidalia inconstans* (*Argynnis inconstans*, Butler, Cistula Entom. i. p. 164 (1873). *Habitat.* Australia.

**Genus ARGYNNIS.**

*Argynnis*, Fabricius, Illiger's Mag. vi. p. 283 (1807). Scudder, Syst. Rev. Amer. Butt. p. 24 (1872). Schütz, Exot. Schmett. ii. p. 118 (1887). Kirby, Allen's Nat. Hist. Libr. Butt. i. p. 52 (1894).

IMAGO.—Male. *Forewing* subtriangular; costa well arched from the base, apex rounded, exterior margin very slightly oblique and nearly even; cell broader than in *Dryas*; first and second subcostal branches emitted before end of the cell; discocellulars outwardly-oblique, upper short, middle deeply concave, lower recurved; middle

median branch emitted at nearly one-fourth before lower end of the cell; middle and lower median and submedian vein nearly straight; median branches and submedian not furnished with androconial scales. *Hindwing* ovate, not so broad as in *Dryas*; exterior margin more convex, apex and anal angle rounded, very slightly scalloped; cell somewhat shorter; upper discocellular outwardly-oblique, lower inwardly-oblique; middle median starting at a short distance before lower end of the cell. Other characters similar to *Dryas*.

TYPE.—A. Aglaia, Linn.

**ARGYNNIS JAINADEVA** (Plate 374, fig. 1, 1a, ♂, 1b, c, ♀).

*Argynnis Jainadeva*, Moore, Entom. Monthly Mag. i. p. 131 (1864); *id.* Proc. Zool. Soc. Lond. 1865, p. 495, pl. 30, fig. 1, ♂; *id.* Sci. Res. 2nd Yarkand Mission, p. 2 (1879). Butler, Ent. Mo. Mag. 1884, p. 66. de Nicéville, Butt. of India, ii. p. 135 (1886).

IMAGO.—Male. Upperside pale or rich fulvous, the base more or less dusky olivescient-fulvous. Cilia fulvescent-white with black vein-points on forewing. Veins black. *Forewing* with four black cell-bars, the fourth including the discocellular veinlet; a transverse inner-discal irregularly-angulated series of narrow lunulate spots which are either entirely separate or each joined to the other by a perceptible continued line on the vein; a diffused speckled costal streak before the apex; an outer-discal row of round spots, a submarginal row of lunules, and a marginal dentated duplex line. *Hindwing* with two black bars closing the cell, which are joined at their upper end; a transverse inner-discal angulated continuous series of narrow lunulate spots, a discal curved row of either three, four, or five round spots, the upper and third being small, minute or absent, followed by a submarginal continuous row of lunules, and then a double marginal line. Underside. *Forewing* paler fulvous; the costal border and apex pale olivescient-yellow; cell and discal markings as above; the apical spots dusky olive, with two silvery-white spots in the interspaces of the two upper outer-discal and submarginal spots, and sometimes two less-defined similar white spots in the interspaces between the costal streak and upper outer-discal spots. *Hindwing* rich deep glossy golden-green; outer border olivescient-yellow, three silvery-white transverse subbasal small rounded spots, three inner-discal larger black-edged spots, a medial-discal series of small much less-defined lunules contiguous to an outer-discal series of larger silvery-white black-edged spots, followed by a contiguous outer row of small red spots with white pupils, and then a submarginal row of silvery-white lunules, these latter are inwardly bordered by olive-green and outwardly by a slender black line. *Body* and palpi above olivescient-ochreous, beneath olivescient; tip of palpi blackish; legs fulvous, femora beneath greyish; antennæ above black, beneath and tip red.

Female. Upperside either paler or darker fulvous than in male, the base more or less dusky olivescens-fulvous, with similar black narrow markings, or either pale or rich deep fulvous and very dusky olive-brown basal areas, with broader black diffusedly-bordered markings and veins. Underside as in the male; the hindwing in some specimens having the silvery-white spots generally somewhat larger and more distinctly black-edged.

Expanse, ♂ 2 to 2 $\frac{6}{10}$ , ♀ 2 $\frac{4}{10}$  to 3 inches.

HABITAT.—North-Western Himalayas.

DISTRIBUTION.—“Taken only at Cheeni in Kunawur, in the Himalayas, at 10,000 feet elevation, flying fast over the meadows, and pitching on tall blossoms of *Cruciferae*” (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 131). “It is very common in Upper Kunawur; not appearing in Lower Kunawur. It is a companion to *A. Kamala*, but only for some twenty miles of its furthest northern range, appearing first on the meadows of Cheeni, the finest village of Kunawur, this and the next ten miles appear its headquarters. I caught it, however, as far to the Eastward, on the bare, treeless, shrubless regions of the Zungcham River, an affluent of the Spiti, in Tibet. It flies from May to November” (Lang, Proc. Zool. Soc. 1865, 496). Major H. B. Hellard obtained it at Pangri and Rogi in Busahir, in July and August, and in Kashmir, in August and September” (MS. Notes). Mr. W. Doherty records it from “Pindari Valley, 9000 feet, in Kumaon. Rare” (J. A. Soc. Beng. 1886, 121). Mr. J. H. Leech took it at “Skardo in July,” and Capt. McArthur obtained it in the “Chonging Valley at 15,000 to 17,000 feet elevation, in July and August.” Examples from Shishi Kuh Valley 9000 to 14,000 feet, taken by Capt. G. H. Colomb, and a female, from Gilgit, are in the British Museum Collection. Mr. L. de Nicéville “took it in several places in Kashmir in June, and also in Ladak” (Butt. India, ii. 136). “Found somewhat rarely in the higher Valleys of the Upper Ganges, from June to August” (P. W. Mackinnon, J. Bombay N. H. S. 1898, 372).

**ARGYNNIS VITATHA** (Plate 374, fig. 2, 2a, b, ♂ ♀).

*Argynnis Vitatha*, Moore, Proc. Zool. Soc. Lond. 1874, p. 568, ♂. de Nicéville, Butt. of India, ii. p. 136 (1886).

IMAGO.—Male. Upperside bright fulvous; basal areas slightly olivescens-fulvous; veins black lined. Cilia fulvescent-white. *Forewing* with three black slender cell-bars and a fourth bar bordering each side of the discocellulars, which latter bar is placed obliquely-outward; a transverse inner-discal irregularly-angulated series of more or less slender spots, a subapical costal speckled streak, an outer-discal row of rounded spots, followed by a submarginal continuous row of dentate spots, which latter are more or less confluent with a duplex marginal line.

*Hindwing* with two slender black bars at end of cell, a transverse inner-discal irregular sinuous line, a curved row of small conically-ovate spots, followed by a submarginal continuous row of dentate lunules and a marginal duplex line. Under-side. *Forewing* pale fulvous, the costal border and apical area pale yellow; the cell and discal markings, as above, less prominent, the apical markings olive-green, the submarginal row of dentate spots each outwardly edged by a silvery-white point. *Hindwing* with the basal area olive-green, the outer border pale yellow; marked with three silvery-white transverse subbasal spots, a single or sometimes two superposed spots in middle of the cell, three inner-discal larger spots, the middle one being placed at end of the cell, a recurved medial-discal row of seven large spots, each of which latter, except the upper, with an outer attached green spot, followed by a submarginal row of silvery-white broad lunules bordered by green.

Female. Upperside much paler fulvous than in male, the bases infuscated, and the posterior margins somewhat greyish; markings similar. *Forewing* with the costal border and interspaces between the submarginal dentate spots and outer marginal line fulvescent-white; the lower marginal interspaces on the hindwing also somewhat fulvescent-yellow. Underside as in the male.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{6}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—N. Kashmir.

DISTRIBUTION.—The type-specimens were taken by Capt. H. B. Hellard on the north side of Rajdianan Pass and Gurais, Kashmir, in July, 1873. Mr. J. H. Leech obtained both sexes at "Skoro La, 15,000 feet elevation in July, 1887." It is also reported as having been taken on the "north side of Darkot, at about 12,000 feet, and also near the Baroghil Pass at about 14,000 feet, and on both the Great and Little Pamirs" (Report Pamir Boundary Comm. 1898, pp. 15; 42). A male and female, labelled Kashgar, is in the British Museum Collection, and also a male from Hunza, taken in July by Mr. Conway.

CHINA AND JAPAN SPECIES.—*Argynnis pallescens*, Butler, Cistula Ent. i. p. 164 (1873). *Habitat.* Japan.—*Argynnis Locuples*, Butler, Ann. Nat. Hist. 1881, p. 134. *Habitat.* Japan.—*Argynnis Vorax*, Butler, Trans. Ent. Soc. 1871, p. 403; Lep. Exot. p. 151, pl. 54, fig. 1 (1873). Leech, Butt. of China, i. p. 232, pl. 22, fig. 5, ♂. *Habitat.* C. and N. China.—*Argynnis Fortuna*, Janson, Cist. Ent. ii. p. 154 (1877). Leech, *l.c.* p. 230, pl. 22, fig. 6. *Habitat.* W. China.—*Argynnis Ornatissima*, Leech, Butt. of China, i. p. 234, pl. 22, fig. 1, 2, ♂ ♀ (1893). *Habitat.* W. China.—*Argynnis Coredippe*, Leech, *l.c.* i. p. 233, pl. 22, fig. 3, 4, ♂ ♀ (1893). *Habitat.* China; Corea.—*Argynnis Nerippe*, Felder, Wien. Ent. Monats, vi. p. 24 (1861); Reis. Nov. Lep. iii. pl. 50, fig. 1, 2 (1867). *Habitat.* Japan.—*Argynnis Coreana*, Leech, Ann. Nat. Hist. 1882, p. 242; Butt. of China, i. p. 234, pl. 22, fig. 7, 8, ♂ ♀. *Habitat.* W. and C. China; Corea; Japan.

Genus BRENTHIS.

*Brenthis*, Hübner, Verz. bek. Schmett. p. 30 (1816). Scudder, Syst. Rev. Amer. Butt. p. 24 (1872).  
Schätz, Exot. Schmett. ii. p. 119 (1887). Kirby, Allen's Nat. Libr. Butt. i. p. 64 (1894).

IMAGO.—Male. *Forewing* subtriangular; first and second subcostal branches emitted before end of the cell; basal area slightly hairy. *Hindwing* broad; exterior margin very convex, slightly scalloped, apex and anal angle rounded; basal area very slightly hairy above, scaly beneath. *Body* finely hairy; palpi sparsely clothed with fine setose hairs, apical joint scaly, free; antennæ gradually thickened to a pyriform club.

TYPE.—B. Hecate, Schiff.

No species of this genus has yet been recorded as occurring within the Indian area.

JAPAN SPECIES.—*Brenthis fumida* (Argynnis Daphne, var. fumida, Butler, Ann. Nat. Hist. 1882, p. 16. Leech, Butt. of China and Japan, i. p. 229). *Habitat*. Japan; Corea.—*Brenthis Rabdia* (Argynnis Rabdia, Butler, Ann. Nat. Hist. 1877, p. 93. Leech, *l.c.* p. 229. *Habitat*. Japan; Corea.

Genus RATHORA.

*Argynnis* (part), Auctorum.

*Issoria*\* (part), Hübner, Verz. bek. Schmett. p. 31 (1816).

IMAGO.—Male. *Forewing* triangular; apex abruptly rounded, exterior margin oblique and slightly concave in middle, slightly uneven; discocellulars slightly concave; first and second subcostal branches emitted before end of the cell. *Hindwing* short, very broad, scutiform; base of costa abruptly lobed, thence straight to end, the apex being pointed, exterior margin convex, uneven; anal angle somewhat produced and pointed. *Body* hairy; palpi densely hairy to the tip; antennæ rather long, the club short and broadly spatular.

TYPE.—R. Lathonia, Linn.

RATHORA ISSÆA (Plate 375, fig. 1, 1a, b, ♂ ♀).

*Argynnis Issæa*, Doubleday, Gray's Lep. Ins. Nepal, p. 11 (1846); *id.* Gen. D. Lep. p. 174 (1848).  
Moore, Catal. Lep. Mus. E. I. Company, i. p. 156 (1857); Proc. Zool. Soc. Lond. 1865, p. 495.  
Butler, Proc. Zool. Soc. 1886, p. 362. Doherty, Journ. As. Soc. Bengal, 1886, p. 121.  
*Argynnis Lathonia*, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 440 (1844). Elwes, Proc. Zool. Soc.

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\* *Egista* became the type of Hübner's genus *Issoria*, in 1832 (see Zutr. Exot. Schmett. iv. p. 32).

Lond. 1882, p. 404; Trans. Ent. Soc. Lond. 1889, p. 556. de Nicéville, Butt. of India, ii. p. 137 (1886). Leech, Butt. of China, i. p. 227 (1892).

IMAGO.—Male. Upperside pale fulvous, with black spots; forewing with the base, costa, and posterior margin, and hindwing with the basal and abdominal area widely dusky olivescens-fulvous; cilia fulvescent-white alternated with dark fulvous and black at tip of veins. *Forewing* with two black bars and a broad bar across middle of the cell, and a broader bar at end of the cell, the latter being sometimes divided by the fulvous discocellular veinlet; a transverse inner-discal angulated series of spots and an additional smaller spot towards the base of submedian interspace; a diffused costal triangular spot beyond; an outer-discal row of seven rounded spots, of which the three, or four upper are decreasingly smaller; followed by a submarginal similar row of more or less lunular spots, and then two marginal coalescent dentated lines. *Hindwing* with an obscure black bar across middle of the cell, and one at its end; a transverse inner-discal angulated series of small black spots, an outer-discal similar row of six large spots, followed by a submarginal row of more lunate-shaped spots, and then two marginal coalescent slightly-dentate lines. Underside. Both wings pale fulvous-yellow, palest apically. *Forewing* with the cell and discal black spots as above, but less prominent; the costal large triangular spot and the five upper submarginal increasingly large oval spots being brilliant silvery-white; the upper and sometimes the lower outer-discal spots also pupilled with silver; all the apical spots are bordered with fulvous-red, and sometimes the lower outer-discal and submarginal spots are either slightly surrounded with red, or the spots themselves are almost red; marginal lines obscure red. *Hindwing* with a prominent brilliant silvery-white precostal spot, a slender curved spot in basal costal interspace below, a very small oval basal and round middle cell-spot, a large elongate spot in basal submedian interspace, and two narrow abdominal streaks; three discal large irregular-shaped spots, the upper placed in the costal interspace, the second extending across and outside end of the cell, and the lower in submedian interspace; below the upper spot are two small narrow basal subcostal pale yellow streaks, and below the middle spot are two very small silvery basal median spots; beyond is a medial-discal recurved silvery-white transverse broken band extending from the costal vein to the submedian, the upper and lower end of which is dilated, its middle portions being slender and lunular; followed by an outer-discal recurved row of very small dark purple-black spots with silver pupils and outer pale fulvous ring; and beyond a marginal series of large conically-triangular silver spots, of which the first, fourth, and seventh, are the smallest; marginal line obscure, red. All the silver spots, except the medial-discal lunular series, are edged by a fine black line, and bordered by fulvous-red of a bright or dark shade.

Female. Upperside. Ground-colour slightly paler than in male, the basal areas

darker olivescient-green; black markings similar, but broader, and on the forewing, the upper submarginal spots are partly confluent with that portion of the marginal line, and their interspaces forming a series of three or four rounded fulvous spots. Underside as in the male. *Body* above olivescient-fulvous; palpi above fulvous; body and palpi beneath pale fulvous-yellow; legs fulvous; antennæ black, tip red.

Expanse, ♂ 2 to 2 $\frac{2}{10}$ , ♀ 2 $\frac{2}{10}$  to 2 $\frac{4}{10}$  inches.

HABITAT.—Western and Eastern Himalayas; W. China.

DISTRIBUTION AND HABITS.—“This is one of the commonest Himalayan species of *Argynnis*, occurring in Simla almost throughout the year. It occurs as far West as Kashmir, thence Eastwards to Sikkim, where, however, it occurs plentifully in native territory only, but has occasionally been taken in the station at Darjiling” (L. de Nicéville, Butt. Ind. ii. 138). “There is hardly a month in the year when this hardy and apparently multi-brooded insect is not to be met with, in the W. Himalayas. It seems to have an antipathy to water; grassy hill tops and sides, particularly where the wild thyme grows seem its favourite grounds” (*id.* Indian Agriculturist, January, 1880). Capt. A. M. Lang says it is “very abundant in the Western Himalayas, from 5000 to 8000 feet elevation. At all seasons of the year, even in winter, when snow lies deep on sheltered slopes, this insect may be seen on open sunny sites” (Proc. Zool. Soc. 1865, 495). “Common at Murree, in August and September, and found along the Hills as far as Thundiana” (Major J. W. Yerbury, P. Z. S. 1886, 362). Mr. W. Doherty records this species as “common all over Kumaon, from Bagheswar, 3500 feet, in the Sarju Valley, to the Lepu Lake 16,000 feet elevation. At very high altitudes the specimens are small” (Journ. As. Soc. Beng. 1886, 121). Major H. B. Hellard obtained it at Simla, Masuri, Pangi in Busahir; and at Gulmurg, Kashmir, June to October” (MS. Notes). “Very common in Masuri and the adjoining Hills, from the earliest spring to late autumn” (P. W. Mackinnon, J. Bomb. N. H. S. 1898, 372). In Sikkim it is “very common in the interior, and has been taken as low as 5000 feet in the station of Darjiling during the winter. It occurs all along the road from Kalimpong to Pedong” (L. de Nicéville, Sikkim Gaz. 1894, 139). Specimens are in the British Museum Collection from Yalung, Tibet, taken in June, from Col. Bingham.

### Genus BOLORIA.

*Argynnis* (part), Auctorum.

*Brenthis* (sect. 2), Felder, Neues Lep. p. 10 (1861).

IMAGO.—Male. *Forewing* somewhat triangular; apex obtusely pointed; exterior margin oblique and slightly convex, even, posterior margin short; basal area very hairy; first subcostal branch emitted before end of the cell, second branch at about

one-sixth beyond the cell; discocellulars outwardly-oblique, upper very short, middle discocellular deeply concave, lower slightly concave; middle median emitted at some distance before lower end of the cell. *Hindwing* very short and broad, almost quadrate, apex and anal angle somewhat pointed, exterior margin even; basal area very hairy both above and beneath; cell broad across its middle; discocellulars disposed very obliquely-outward; middle median emitted at some distance before lower end of the cell. *Body* densely hairy; palpi densely hairy, apical joint imbedded in hairs; antennal club short, thick, oval.

TYPE.—B. Pales, Schiff.

**BOLORIA SIPORA** (Plate 375, fig. 2, 2a, b, ♂, 2c, d, ♀).

*Argynnis Sipora*, Moore, Proc. Zool. Soc. Lond. 1874, p. 568, pl. 66, fig. 11, ♀. de Nicéville, Butt. of India, ii. p. 139, pl. 18, fig. 72, ♂ ♀ (1886).

*Argynnis Buralacha*, Moore, P. Z. S. Lond. 1882, p. 242, pl. 1, 1a, ♂.

IMAGO.—Male. Upperside pale fulvous, varying from yellowish to brighter shade; basal areas irrorated with black scales and clothed with fulvous hairs. Cilia paler fulvous, slightly alternated with fulvescent-black. *Forewing* with a black slender short bar, two superposed dots and a slender recurved bar within the cell, and an incurved bar at its end; in some specimens the inner cell-bar and the lower dot, or both dots, are absent; a black slender dentate spot in the submedian interspace below the cell; a transverse inner-discal zigzag series of more or less narrow lunular spots, the three lower of which are somewhat angled, the lower most distinctly; a slightly-defined subapical costal diffused patch, an outer-discal recurved row of small conical spots, a submarginal row of more triangular shaped spots, and a marginal row of less-defined spots confluent with the outer marginal line, one being placed at end of each veinlet. *Hindwing* with two black slender parallel bars at end of the cell, which are more or less separated from the dark basal area; beyond is an inner-discal transverse irregular and almost continuous slender sinuous lunular line, an outer-discal row of six very small spots, a submarginal row of dentate spots, and then a marginal macular duplex line. Underside. *Forewing* paler fulvous, apex and outer border yellow and blotched with castaneous red; cell and discal black markings, as above, less defined. *Hindwing*. Ground-colour yellow, base and abdominal border somewhat greenish; crossed by a broad irregular subbasal and a clouded discal deep castaneous-red band; the subbasal band enclosing a pearly-white round spot in middle of the cell, and an oval spot below the cell, this band also being sharply defined externally by a slender black edge-line and then narrowly bordered externally by pearly-white divided into three portions; the discal band is inwardly-edged by a series of more or less



apparent slender blackish lunules, and also traversed inwardly by a sinuous series of less-defined pearly-white lunules, which latter are widest at the costal and anal end; followed by an outer-discal row of more or less apparent black or dusky-red small spots, and then a marginal row of quadrate pearly-white spots, inwardly edged by a more or less blackish lunule. *Body* and palpi dusky fulvous, and clothed with long fulvous hairs; body beneath and legs pale fulvous; antennæ black above, beneath and tip fulvous.

Female. Upperside more dusky fulvous than in male, the basal areas also darker; the black markings broader and more prominent; the outer-discal and submarginal spots larger, and occasionally these two series are longitudinally confluent; the subapical interspaces of forewing and the submarginal and marginal intervening spaces of both wings paler fulvous or whitish. Cilia more heavily alternated with black. Underside as in the male, the colours being brighter and markings more prominent.

Expanse, ♂ ♀,  $1\frac{4}{10}$  to  $1\frac{6}{10}$  inch.

HABITAT.—Kashmir; Lahoul.

DISTRIBUTION.—Capt. H. B. Hellard's specimens were taken in "Kashmir near the Gungabul Lake, at foot of the Haramook Peak, in September, and also on the South side of Sarsungar Pass, Stakpila Pass, and Upper Boorzil Valley, Kashmir, in July, generally over 12,000 feet elevation" (MS. Notes). Mr. L. de Nicéville obtained "a large series in June and July in Kashmir and Lahoul, and a single specimen at Zoji La, Kashmir, at about 11,000 feet elevation, in June" (Butt. Ind. ii. 139). Mr. J. H. Leech took both sexes in the Deosai Plains, 13,000 feet elevation in August, and has examples from Kokser, taken in July, and from the Baralacha Pass, taken in August, by Capt. H. MacArthur. Col. C. Swinhoe has specimens from Kulu.

**BOLORIA GENERATOR** (Plate 376, fig. 1, 1a, b, ♂ ♀).

*Argynnis Pales*, var. *generator*, Staudinger, Stett. Ent. Zeit. 1886, 235.

IMAGO.—Differs from *B. Pales* and *Sipora*, in both sexes having the forewing more subtriangular in shape, the costa more arched and the outer margin curved and less oblique. *Forewing* with two blackish very obscurely-defined slender bars and a dot within the cell, and a curved streak at its end; the ordinary inner-discal irregular series of marks, subapical patch and the outer-discal row of spots, also very obscurely defined, being more or less obsolete hindward; the submarginal row of spots and marginal line somewhat more defined. *Hindwing* with two black very slender cell-bars and inner-discal sinuous marks very obscurely defined, the outer-discal and submarginal row of spots somewhat more defined, the marginal line slender. Underside.

*Forewing* paler fulvous, the costal and apical area yellow; apical markings obscurely castaneous-red; cell and discal marks obsolete. *Hindwing*. Ground-colour yellow, the abdominal margin pale olive-brown; markings similarly disposed as in *Pales* and *Sipora*, but differ in the basal castaneous band being narrower and directed more obliquely inward to the costa, the portions of its outer pearly-white border being broader, the adjoining upper-discal yellow area is twice as broad, and the yellow colour extends through the upper median interspace to outer-discal border, the ordinary outer-discal small black spot being absent in this interspace; the lower portion of the medial-discal pearly-white lunules is much longer and more prominent; the marginal pearly-white spot less prominent.

Female. Upperside slightly paler fulvous than in male. Both wings with the cell, discal, and outer markings somewhat more defined. Underside as in the male.

Expanse, ♂ 1 $\frac{8}{10}$ , ♀ 2 inches.

HABITAT.—Namangan, Tian Tehan, Turkestan; Skoro La, W. Ladak; N. Afghanistan.

DISTRIBUTION.—Specimens of both sexes from Namangan; Kashgar; and from Hunza, are in the British Museum Collection, and a male and female from Murgarh, N. Afghanistan, in Mr. P. Crowley's Collection. Mr. J. H. Leech took several specimens at Skoro La, 15,000 feet elevation, in July.

Our illustrations of this species on Plate 376, fig. 1, 1a, b, are from a male and female example taken by Mr. Leech at Skoro La.

#### **BOLORIA HEGEMONE** (Plate 376, fig. 2, 2a, ♂).

*Argynnis Hegemone*, Staudinger, MS. Alpheraky, Horæ Soc. Ent. Ross. xvi. p. 407, pl. 15, fig. 16, 17, ♂ ♀ (1882).

IMAGO.—Male. Upperside pale fulvous, base of both wings greyish-black. Cilia whitish. *Forewing* yellowish along the costa; a slightly-defined black very slender short bar near base of the cell, a recurved broader bar across middle of the cell and a streak at end of cell; a transverse inner-discal irregular zigzag series of slender short bars, the lowest being angled; a slender short bar also present below the cell in the submedian interspace; followed by an outer-discal row of conical spots; a submarginal row of smaller dentate continuous lunules, which are coalescent with the marginal line. *Hindwing* with a black narrow bar near outer end of the cell which is joined to a short bar on upper end of the discocellular; an inner-discal zigzag series of slender short lunate bars, followed by an outer-discal row of six rounded spots, a submarginal row of dentate lunules coalescing with the marginal line. Underside paler fulvous. *Forewing* with the costa, apex, and outer margin whitish; the cell and discal and outer markings

less prominent, the upper outer-discal spots with white centres. *Hindwing* with two black-edged white subbasal patches, a broad whitish zigzag discal band with its lower portion tinged with grey; followed by an outer-discal whitish fascia bearing a row of small black-ringed spots centred with greyish-white; and then a marginal continuous row of broad whitish conical spots inwardly edged by a slender black lunule.

Female. Upperside paler than in male, the apex of forewing also paler yellow; the cell, discal, and outer black markings somewhat broader. *Forewing* with two black short curved subbasal bars in the cell, or the second bar is very small and still shorter, the middle and outer cell-bar being as in the male; the discal zigzag marks are slightly conjoined, the subbasal spot in submedian interspace is either slightly or acutely dentate, the outer marginal interspaces are pale yellowish. *Hindwing* with the discal and outer markings somewhat broader, the marginal interspaces being pale yellowish. Underside brighter than in male. *Forewing* with the markings, as above, similar; the apical border more yellowish. *Hindwing* with similar markings as in male, but with their interspaces yellowish, and there is a small black dot in middle of the cell.

Expanse, ♂  $1\frac{5}{10}$ , ♀  $1\frac{6}{10}$  inch.

HABITAT.—Koulja; Namangan; Tian Tchan; N. Ladak.

DISTRIBUTION.—The type is recorded from Koulja. Specimens are in the British Museum Collection from Namangan, and Tian Tchan. Mr. J. H. Leech has examples from the Chonging Valley, 15,000 feet elevation, N. Ladak, taken in July and August by Capt. MacArthur.

Our illustrations of this species on Plate 376, fig. 2, 2a, are from a Chonging Valley example of the male.

**BOLORIA JERDONI** (Plate 376, fig. 4, 4a, b, ♂ ♀).

*Argynnis Jerdoni*, Lang, Entomologists' Monthly Mag. v. p. 34 (1868). de Nicéville, Butt. of India, ii. p. 140 (1886).

*Argynnis Cashmirensis*, Moore, Proc. Zool. Soc. Lond. 1874, p. 267, pl. 43, fig. 4.

IMAGO.—Male. Upperside bright fulvous; cilia fulvescent-white alternated with black. *Forewing* with the base and posterior margin below the submedian vein fulvescent-brown; a black short bar bordering the dark base of the cell, a rounded, or in some, an incurved lunate spot in middle of the cell, a bar which is either slightly excurved or nearly obliquely-straight across the cell beyond the middle, and then an incurved bar at end of the cell; a transverse inner-discal zigzag series of seven somewhat quadrate spots, of which the four upper are more or less confluent;

in the submedian interspace below the cell is an additional spot which is either somewhat quadrate or acutely angled; beyond is a subapical costal less distinct diffused triangular patch, followed by an outer-discal slightly recurved row of seven almost quadrate spots, a submarginal curved row of smaller dentate spots, and then a marginal line which is expanded at end of each vein. *Hindwing* with the base fulvescent-black and an obscure fulvous-bordered black streak at end of the cell; an inner-discal angulated series of black spots partly bordering the dark basal area and which are more or less slender and continuous anteriorly, followed by an outer-discal curved row of six round spots, a submarginal row of dentate spots, and then a marginal almost duplex dentated line. Underside. *Forewing* pale fulvous, the costal border, apex, and outer margin yellow; the cell and discal black markings narrower and less defined, the anterior spots of outer-discal and submarginal row with a white central dot; the subapical costal streak, borders of apical spots and marginal macular line more or less castaneous; a black patch at base of submedian interspace. *Hindwing*. Ground-colour yellow, the base and blotched patches on outer-discal area castaneous; two basal small silvery-white spots with black-speckled edges, and two similar smaller blacker spots in middle of the cell; a transverse inner-discal broad curved band with irregular angulated slender black edges, the band composed of three silvery-white portions and yellow intervening spaces, as follows—the upper silvery portion placed between the costal and subcostal vein, the next across end of the cell and divided by the discocellular veinlet, the third portion being between the lower median and submedian vein, the first and third silvery portion being much constricted; beyond is an outer-discal curved row of six prominent small white-pupilled black spots, followed by a marginal row of silvery-white quadrate spots, each of which latter is separated by a castaneous-red streak and bordered inwardly with a similar red or blackish dentate lunule. *Body* and palpi above fulvescent-brown, beneath yellowish; legs fulvous; antennæ black above, beneath and tip fulvous.

Female. Upperside slightly paler fulvous than in male, basal areas and black markings the same as in male; with the subapical interspaces of the forewing and of the outer marginal markings in both wings distinctly paler. Underside as in the male.

Expanse, ♂ ♀  $1\frac{6}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Kashmir.

DISTRIBUTION.—The type-specimen, in Capt. A. M. Lang's Collection, was taken by Dr. Jerdon in Gulmurg, S. W. Kashmir. Mr. L. de Nicéville obtained "a large series of both sexes at Chunpur, Kashmir, in June. Mrs. R. Bazett also took it in considerable numbers at Bayadmulla, 6500 feet elevation, and elsewhere in Kashmir at 8500 feet, in June, and records it also from Sunamurg, N. E. Kashmir"

(Butt. Ind. ii. 140). Capt. H. B. Hellard also obtained it at "Sunamurg, and south side of the Stakpila Pass, near the top, in July" (MS. Notes). Mr. J. H. Leech took it in the Goorais Valley, Kashmir, at 7000 feet, in June.

**BOLORIA CHITRALENSIS** (Plate 376, fig. 3, 3a, ♂).

IMAGO.—Male and female. Smaller than *B. Jerdoni*. Upperside bright deep reddish-fulvous; basal areas blacker. Both wings with similar but more compactly-disposed black markings. Underside. *Forewing* bright deep fulvous, apex slightly yellowish interspaced; markings smaller than in upperside, apical spots white pupilled. *Hindwing* very dark castaneous-red, slightly paler ochreous on middle of outer-discal area; markings similar to those in *B. Jerdoni*, the inner-discal transverse silvery-white markings smaller, narrower, and the upper and lower portions more constricted; the discal row of white-pupilled black spots very prominent; the marginal silvery-white spots narrower.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{5}{10}$  inch.

HABITAT.—Chitral, N. of Kashmir.

Specimens from Chitral are in the collections of Mr. H. Grose-Smith and Mr. P. Crowley.

**BOLORIA GEMMATA** (Plate 377, fig. 1, 1a, b, ♂ ♀).

*Argynnis Gemmata*, Butler, Annals and Mag. of Nat. Hist. 1881, p. 32, pl. 4, fig. 1, 1a, ♂. Elwes l.c. 1881, p. 467; *id.* Proc. Zool. Soc. Lond. 1882, p. 404, pl. 25, figs. 6, 7, ♂ ♀. de Nicéville, Butt. of India, ii. p. 138 (1886).

IMAGO.—Male. Upperside pale fulvous, of either a yellowish or reddish tinge; the base densely irrorated with black scales and clothed with fulvous hairs. Cilia fulvous or fulvescent-white. *Forewing* with a black reniform mark and a straight bar across middle of the cell, and a broader constricted bar at its end; a transverse inner-discal angulated series of six spots, the upper three being partly conjoined, a subapical costal diffused triangular spot, an outer-discal slightly recurved regular row of seven somewhat rounded spots, a submarginal parallel row of more or less dentate spots, followed by an inner marginal lunular line more or less confluent with an outer marginal slender even line. *Hindwing* with a transverse inner-discal angulated series of either separated or partly confluent black spots bordering the basal black area; an outer-discal curved row of rounded spots, a submarginal row of lunate spots, and then a duplex marginal partly confluent line. Underside. *Forewing* paler fulvous, the apex ochreous-red; cell and discal black markings somewhat smaller; the subapical costal spots, a pupil in the three upper outer-discal spots, and the five upper submarginal triangular spots being prominently silvery-

white. *Hindwing* with the ground-colour yellow, blotched with deep castaneous-red in the cell, costal, medial-discal, and outer marginal interspaces; marked with prominent silvery-white spots with slender black edges, as follows:—two small spots above base of the cell, one in middle of the cell, an elongated spot at end of the cell, an inner-discal angulated series of spots, the upper larger and irregular-shaped, the two next minute, the fourth elongated and extended from end of the cell, the fifth minute, and the next elongated; followed by a slender streak in the submedian interspace and another along the abdominal border; beyond is a medial-discal sinuous series of spots, of which the two upper and the three lower are large and dentate in shape, the upper third spot being minute; followed by an outer-discal curved row of six minute round ocellate spots, and then a marginal row of large triangular spots. *Body* above fulvous-black, clothed with fulvous hairs; palpi dusky fulvous; body beneath and legs fulvous-red; antennæ above black, beneath and tip red.

Female. Upperside pale fulvous; basal areas and posterior margin of forewing dusky grey. Cilia alternated with dusky fulvous; markings as in the male, but more compact. *Forewing* with the interspaces between the subapical diffused spot and the upper outer-discal spot, and also between the submarginal spots and marginal line more or less fulvous-white or quite white. *Hindwing* with the slender interspace between the submarginal spots and marginal black border also more or less fulvous white. Underside as in the male. *Hindwing* with all the silvery-white markings broader, the red interspaces much darker.

Expanse, ♂ ♀  $1\frac{5}{10}$  to  $1\frac{8}{10}$  inch.

HABITAT.—Eastern Himalayas.

DISTRIBUTION.—“I saw this insect first on the high Chola Range in 1870, and have since obtained it in quantity from natives who have been sent to Chumbi and Western Bhotan” (H. J. Elwes, Tr. Ent. Soc. 1883, 349). “Apparently very common in July at high elevations in Native Sikkim” (L. de Nicéville, Sikkim Gaz. 1894, 139).

#### **BOLORIA ALTISSIMA** (Plate 377, fig. 2, 2a, ♀).

*Argynnis Altissima*, Elwes, Proc. Zool. Soc. Lond. 1882, p. 403, pl. 25, fig. 8, ♂. de Nicéville, Butt. of India, ii. p. 139 (1886).

IMAGO.—Male and female. Upperside pale fulvous, palest in the male; basal areas irrorated with black scales, speckled with grey in female, and clothed with fulvous hairs. Cilia white, alternated with black. *Forewing* with ordinary black cell-bars, inner-discal angulated series of small spots, a subapical costal patch,

medial-discal row of very small round spots, followed by a submarginal row of black confluent dentate spots merging into the marginal band and traversed by a row of decreasing small white spots, the upper ones of which are rounded, the lower lunular and slightly fulvescent; the interspaces between the subapical costal patch and the upper medial-discal spots also white. *Hindwing* with an ordinary black inner-discal angulated continuous series of narrow lunular spots, the upper ones being well separated from the black basal area; a curved medial-discal row of small rounded spots, followed by a black marginal band traversed by a row of prominent white spots, the upper three of which are longitudinally-oval, the second and third being the longest, the fourth round, the three lower broken and somewhat hastate in shape. *Underside*. *Forewing* pale fulvous, the costa grey; basal and discal black markings, as above, but much less defined; the discocellular streak grey-centred; subapical triangular spots and submarginal spots silvery greyish-white, the upper of the latter longitudinally-oval, the lower somewhat hastate in shape. *Hindwing*. Ground-colour olive-yellow, the basal, medial-discal, and outer marginal interspaces more or less castaneous and irrorated with black scales; two small silvery-greyish white upper basal spots, another in middle of the cell, an oblique streak at end of cell, an inner-discal irregular series of spots of which the upper one is placed in the costal interspace and is obliquely elongated, the next two very small, the next much elongated and joined to the cell-streak, the next two in the median interspaces small, a lengthened narrow streak in the submedian and another in the internal interspace; beyond is a medial-discal curved row of spots, the two upper being the largest, the next small, the three next placed in the median and submedian interspaces being dentate; followed by an outer-discal row of very small spots, which are also black speckled; and then a marginal row of longitudinally-narrow oval spots; all these silvery spots are slightly black-edged. *Body* blackish, clothed with fulvous hairs; palpi above fulvous, clothed with blackish hairs, beneath greyish; body beneath greyish; legs fulvous; femora grey beneath; antennæ black above, beneath and tip fulvous.

Expanse,  $1\frac{2}{10}$  to  $1\frac{4}{10}$  inch.

HABITAT.—Chumbi, Tibetan frontier of Sikkim; Bhotan.

DISTRIBUTION.—“Only found in the high ranges on the eastern frontier of Sikkim, and in Bhotan; the exact locality and elevation unknown, as it has never been taken by a European. Those which I have received recently from Bhotan are somewhat larger than the type, but do not vary except in size” (H. J. Elwes, Trans. Ent. Soc. 1888, 350). “Very rare; has only, I believe, been obtained on two occasions by Mr. Elwes’ native collectors in Native Sikkim at an even higher elevation than that at which *A. gemmata* was found” (L. de Nicéville, Sikkim Gaz. 1894, 139).

**BOLORIA MACKINNONII** (Plate 377, fig. 3, 3a, ♂ ♀).

*Argynnis Mackinnonii*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 346, pl. F, figs. 4, 5, ♂ ♀).

IMAGO.—“Male. Upperside. Both wings bright fulvous, the base more or less heavily irrorated with black. *Forewing* with the usual double zigzag black lines across the middle of the discoidal cell, a black streak closing the cell, and exactly midway between these streaks is another narrowest one extending across the cell; the disc bears three series of black spots—the first is placed irregularly just beyond the cell, and consists of six irregularly-shaped spots, the second consists of a regularly sinuous series of seven round spots, the third of eight cordiform spots, following the outline of the outer margin; this latter is narrowly black; a small triangular black patch on the costa placed just within the middle series of black spots. *Hindwing* with a pair of elongated streaks joined at both ends at the end of the cell, a curved series of spots immediately beyond the cell, then another series of five or six rounded spots, followed by a series of seven lunulated spots, between these latter and the black outer margin is a series of pale fulvous spots which are much more distinct in some specimens than in others. Underside. *Forewing* bright fulvous; all the black spots of the upperside present but much smaller; an oblique apical rich castaneous streak, inwardly marked with two outwardly by four silvery spots. *Hindwing* with the ground-colour much more yellow than in the forewing, the base bearing large blotches of rich castaneous, with prominent discal and marginal bands of the same colour; with the following silvery spots:—a small one placed on the precostal nervure, one filling the base of the costal interspace, and a large one placed obliquely across its middle; a small round spot in the middle of the cell, a large elongated one filling its outer end, joined to another elongated spot in the discoidal interspace reaching to the outer edge of the discal rich castaneous band, this latter bears on its outer edge a series of seven more or less wedge-shaped spots, the uppermost of which in the costal interspace is much the largest; an elongated narrow silvery streak in the submedian interspace, which springs from the base of the wing and ends on the inner edge of the rich castaneous discal band, the streak is quite separated or broken into two portions at about its middle; there is a second narrow streak in the internal interspace, which commences opposite the point where the streak in the submedian interspace is broken and reaches the abdominal margin; a very indistinct somewhat ocellular series of spots placed in the middle of the band of the ground-colour between the discal and marginal rich castaneous bands; the latter bearing a prominent series of more or less oval silvery spots, one in each interspace. Cilia of both wings on the upperside pale fulvous, of the forewing on the underside on the apical half of the wing pale fulvous alternated with darker fulvous, on the hindwing pale fulvous throughout.



“Female. Upperside. Both wings darker fulvous than in the male, all the black spots larger, the black basal irroration much more extensive, completely filling the sutural area of the forewing, the outer margin broadly black, bearing a series of very pale yellow, almost whitish, spots. Underside. *Forewing* as in the male, but all the markings more prominent. *Hindwing* with the ground-colour more of a greenish tinge, the rich castaneous bands and the silvery spots more prominent. Cilia very pale yellowish, almost white, on the forewing prominently, on the hindwing obscurely alternated with darker.”

Expanse, ♂  $1\frac{5}{10}$  to  $1\frac{6}{10}$ , ♀  $1\frac{6}{10}$  to  $1\frac{7}{10}$  inch.

HABITAT.—Busahir, N.W. Himalayas.

DISTRIBUTION.—“Taken by Mr. P. W. Mackinnon’s native collectors in the upper part of the Buspa Valley, an affluent of the Sutlej, at 11,000 feet elevation, and in the Gonas Pass, in August” (Journ. Bombay N. H. S. 1898, 372). The two specimens referred to by Mr. Butler, in his description of *A. gemmata*, as having been taken by Major Charlton, are identical with Mr. de Nicéville’s figure of *A. Mackinnoni*.

**BOLORIA CLARA** (Plate 378, fig. 1, 1a, b, c, d, e, ♂ ♀).

*Argynnis Clara*, Blanchard, Jacquemont’s Voy. dans l’Inde, iv. p. 20; Ins. pl. 2, fig. 2, 3, ♂ (1844).  
de Nicéville, Butt. of India, ii. p. 136 (1886); Journ. Bombay Nat. Hist. Soc. 1889, p. 165, pl. A, fig. 6, ♀.

IMAGO.—Male. Upperside. Ground-colour of various shades of dull fulvous, base thickly irrorated with dusky olivescient fulvous-brown scales, in some the outer borders are also slightly powdered with dusky scales; veins black lined; cilia white alternated with black. *Forewing* with the *upper, middle and lower median and the submedian*, for a portion of their length from the base *thickened with black raised androconial scales*; a black reniform mark in middle of the cell, a comma-shaped streak beyond and then a duplex mark at end of the cell; a transverse inner-discal sinuous series of narrow somewhat quadrate spots, a diffused subapical costal streak, an outer-discal row of seven rounded spots, followed by a submarginal series of narrow-dentated lunules bordering an inner marginal line, and then an outer marginal line; the interspaces of submarginal dentate marks being slightly paler than the ground-colour. *Hindwing* with a black quadrate spot at end of the cell, an inner-discal sinuous series of narrow angled spots, an outer-discal row of cordate spots, followed by a submarginal row of lunules, bordering an inner-submarginal line with slightly paler interspaces than the ground-colour, and then an outer marginal line. Underside. *Forewing* paler, but of a redder-fulvous; the black markings as above, but less prominent, the interspaces of submarginal dentate marks and of the subapical

streaks and upper-discal spots being prominently silvery-white. *Hindwing* golden-green, powdered with black scales; a slightly black-edged silvery-white subbasal slender broken streak, a dot in middle of the cell, an inner-discal outwardly-oblique sinuous broken series of slender streaks, a prominent discal excurved row of longitudinal narrow spots, and a submarginal row of triangular spots.

Female. Upperside. Both wings with the fulvous ground-colour, as in male, almost entirely overlaid with dark bronzy-greenish or grey scales, or these bronzy scales are restricted to the basal areas, and the outer areas either greyish-black or deep greyish-purple; the black markings larger. *Forewing* also with the middle cell-bar placed on a fulvous ground, the disc with fulvous streaks between the veins, and a submarginal series of whitish dentate spots, and a less-defined inner submarginal upper row of pale spots. *Hindwing* also with a more or less prominent curved discal series of rich fulvous narrow spots, two submarginal series of dentate spots, either both whitish or the inner is sometimes fulvescent. Underside. Both wings as in the male.

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{1}{10}$  inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—“Several examples were taken about the middle of August, 1883, by Mr. J. C. Pyne (who accompanied Mr. J. F. Duthie on a trip into the Gurhwal Himalayas) on the side of a mountain called Phulaldaru in the Nila Valley. The elevation must have been about 12,000 feet, and the locality in the territory of Tihri Gurhwal” (L. de Nicéville, Butt. of India, ii. 137). Specimens, taken as above noted, are in the British Museum Collection, and have locality labels attached as follows:—“Kalom Valley, 12,000 feet, August; Bilang in Dhaul Valley, 13,000 to 14,000 feet; Kharga, 14,000, August; Phulaldaru, 14,000, August; and Soosa, N. Kumaon.” Col. C. Swinhoe and Mr. J. H. Leech have also specimens from the Kali Valley, Tihri Gurhwal. Captain H. B. Hellard took it on the “North side of the Rupin Pass, from about 12,000 feet to near the top of the Pass, in September” (MS. Notes). “Mr. P. W. Mackinnon obtained this species in large numbers, through his native collectors, from several places in Tihri Gurhwal, at considerable elevations, in August” (L. de Nicéville, *l.c.* 166).

CHINESE SPECIES.—*Boloria dilutior* (Argynnis Selene, *var. dilutior*, Staudinger, Rom. Mem. Lep. iii. p. 303 (1887). *Habitat.* Manchuria.—*Boloria Perryi* (Brenthis Perryi, Butler, Ann. Nat. Hist. 1882, p. 16. Arg. Selene, *var. Perryi*, Leech, Butt. of China, i. p. 223, pl. 24, fig. 13 (1893). *Habitat.* Corea.—*Boloria Gong* (Argynnis Gong, Oberthür, Etudes Ent. ix. p. 15, pl. 2, fig. 9 (1884). Leech, Butt. of China, i. p. 224. *Habitat.* W. China.—*Boloria Charis* (Argynnis Charis, Oberthür, Et. Ent. xv. p. 8, pl. 1, fig. 4 (1891). *Habitat.* Yunan.—*Boloria Rhea* (Argynnis Rhea, Gr. Gr. Horæ Ross. 1891, p. 456. Leech, *l.c.* pl. 24, fig. 15, ♂. *Habitat.* E. Tibet; W. China.

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END OF VOL. IV.





1



1a



1d



1b



1c



2



2a





1



2



3a



3b



4



4a





1



1b



1a



1c



1e



1g



1d



1f





1



1a



1c



1e



1f



1d







1



1b



1a



1b



2a



2b



2







1



1b



1a



1c



1d



2

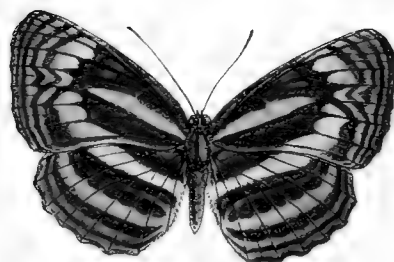


2b





1



1b



1a



1c



1e



1g



1d



1f





1.



1<sup>a</sup>



1<sup>c</sup>



1<sup>b</sup>







1



1<sup>a</sup>



2



2<sup>a</sup>



3



3<sup>a</sup>



4



4<sup>a</sup>





1



1<sup>a</sup>



1<sup>b</sup>



1<sup>c</sup>

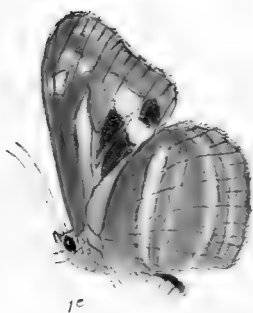


1<sup>d</sup>

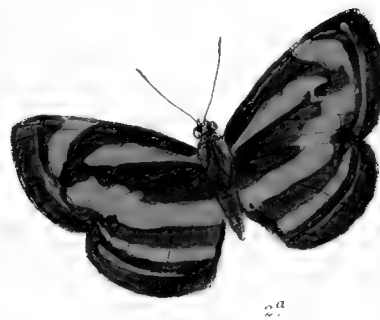


1<sup>e</sup>















1.



1b



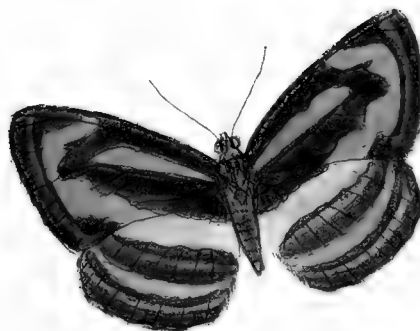
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1e



1c



1d





1a



1c



1.



1b



1e



1d

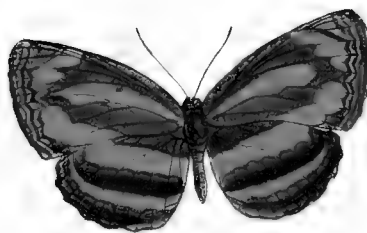


1f





1



1a



2



2a



2b



2c

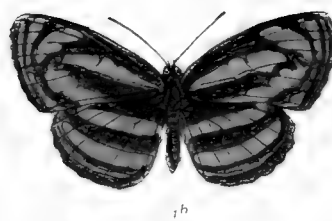
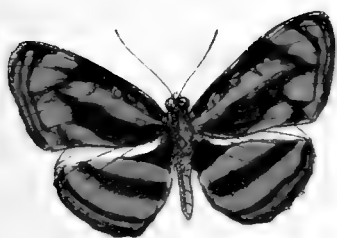


2d



2e



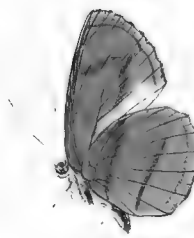








1



1a



2



2b



2a



2c



2d



2e





1.



1<sup>b</sup>



1<sup>a</sup>



1<sup>c</sup>



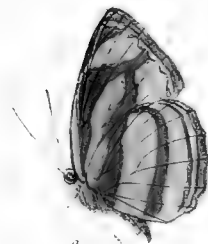
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1<sup>e</sup>



2



2<sup>a</sup>





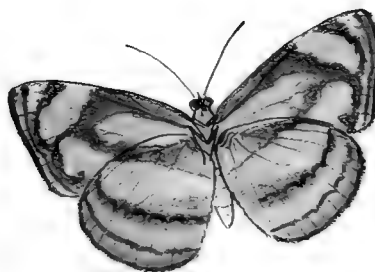
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1b



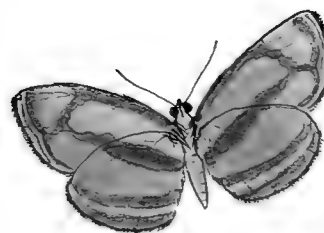
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1c



2



2a





1b



1c



1a



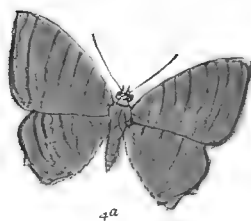
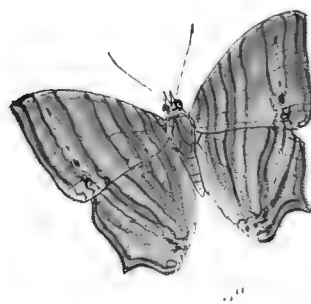
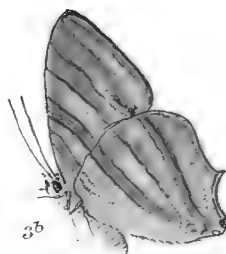
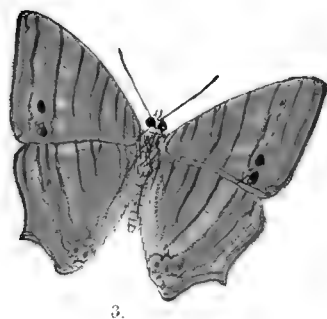
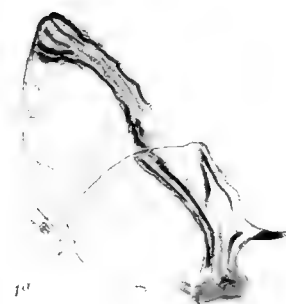
2



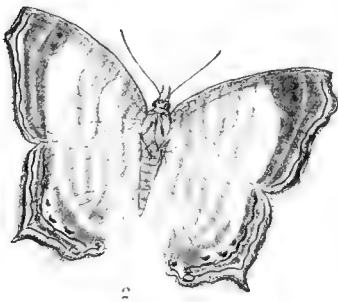
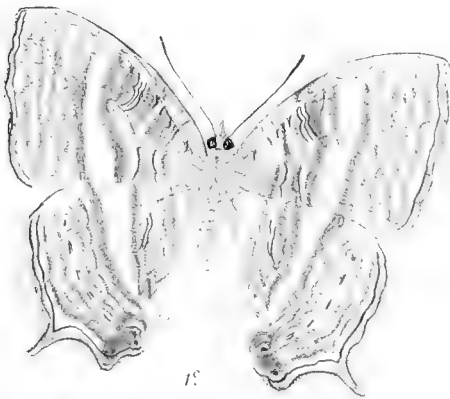
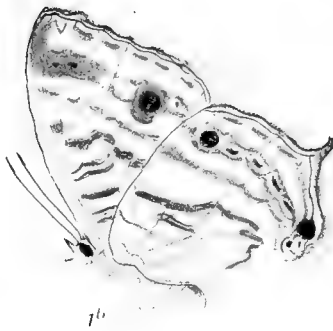
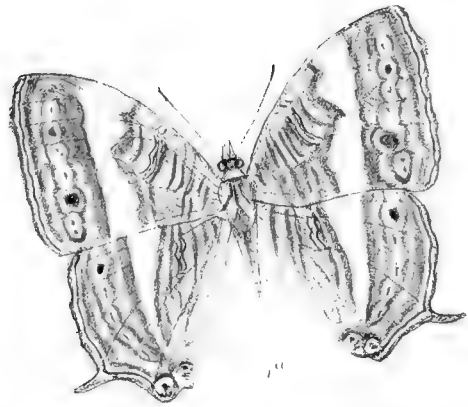
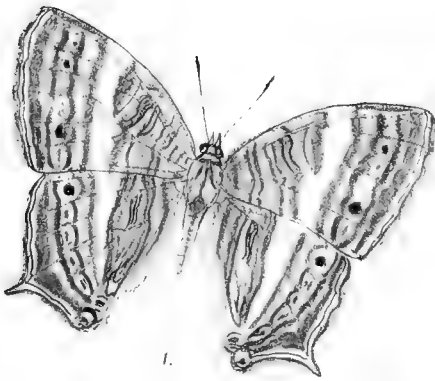
2a















1a



1b



1c



1d

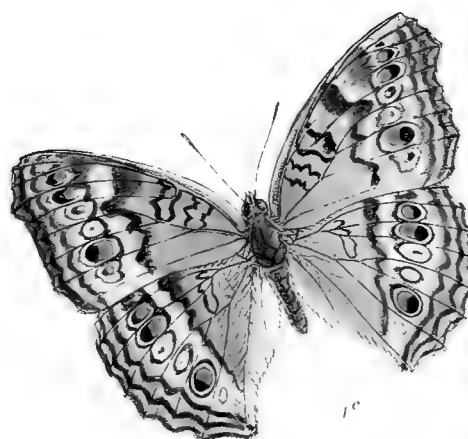
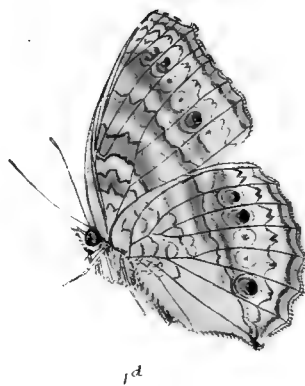
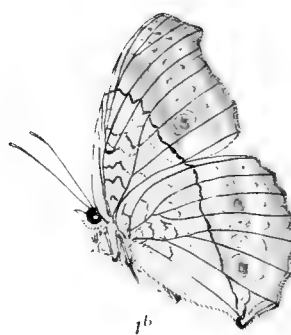
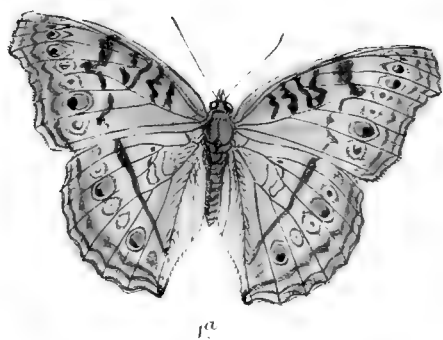


1e



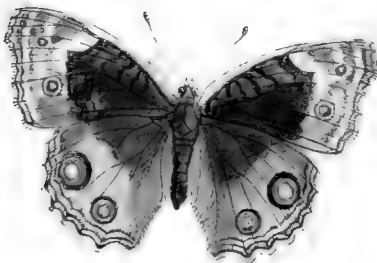
1f



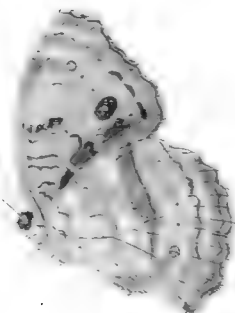








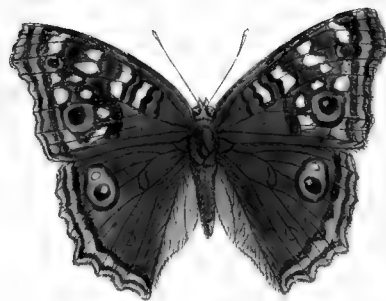




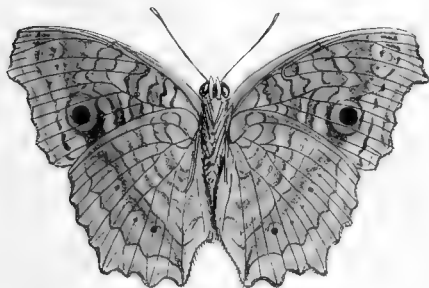




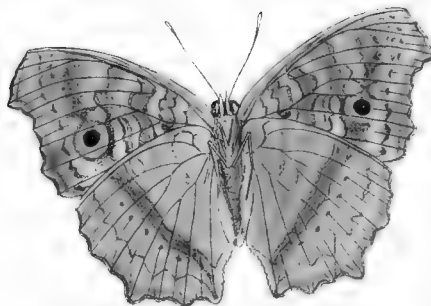
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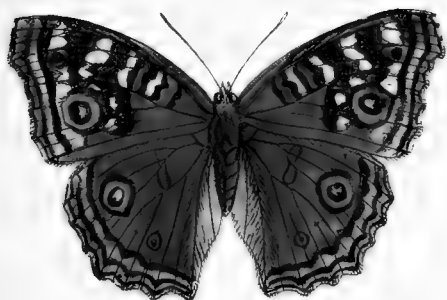
1<sup>a</sup>



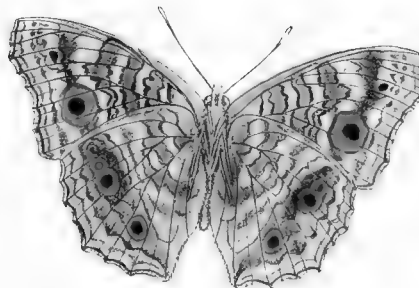
1<sup>b</sup>



1<sup>c</sup>



1<sup>d</sup>

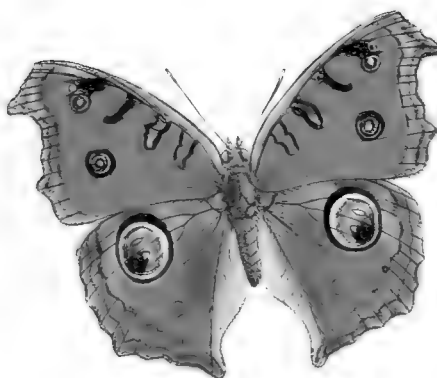


1<sup>e</sup>

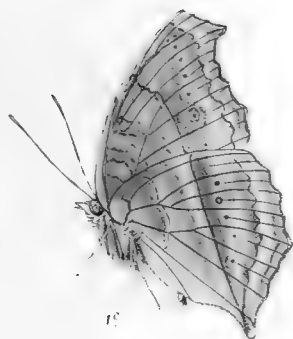




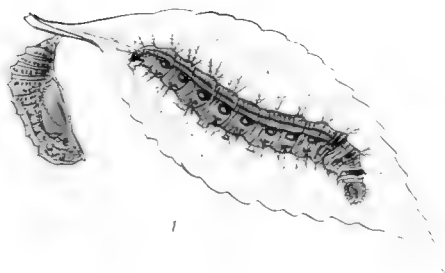
1<sup>a</sup>



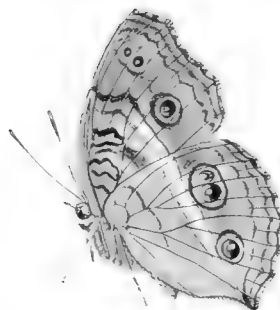
1<sup>b</sup>



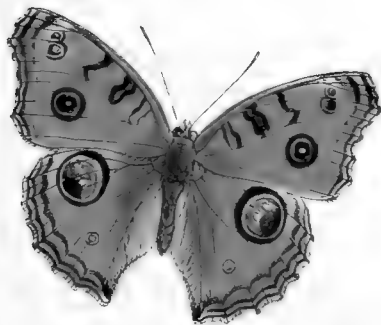
1<sup>c</sup>



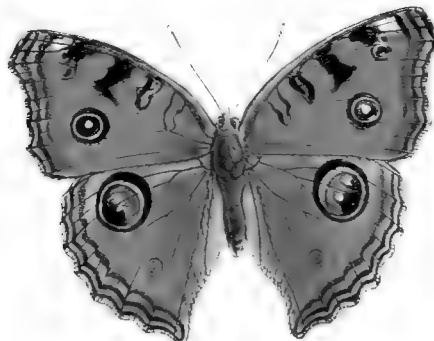
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1<sup>d</sup>



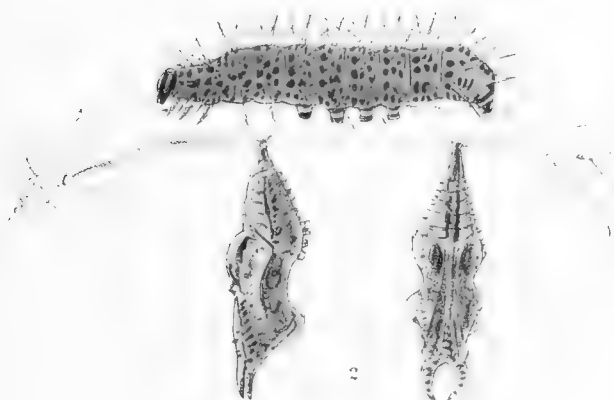
1<sup>e</sup>



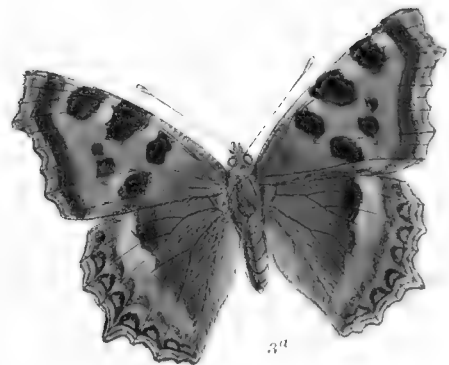
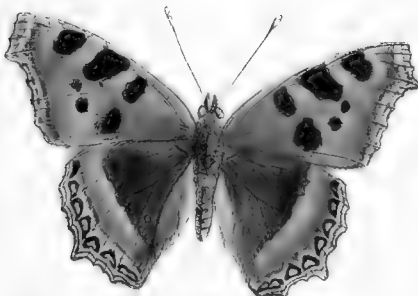
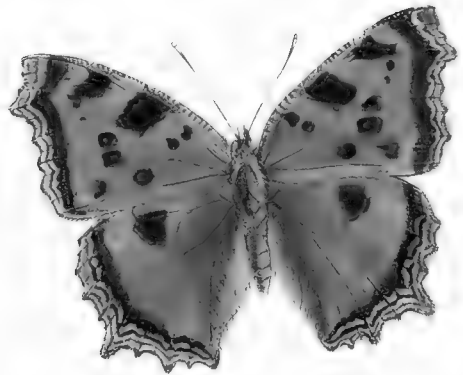
1<sup>f</sup>



















1.



1a



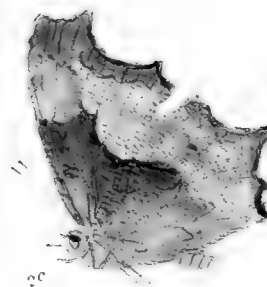
2



2b



2a



2c



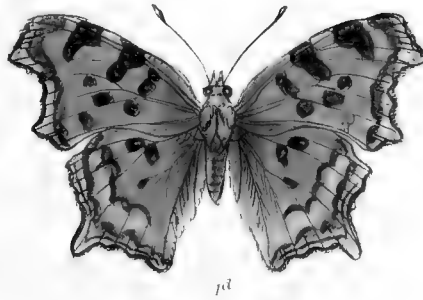
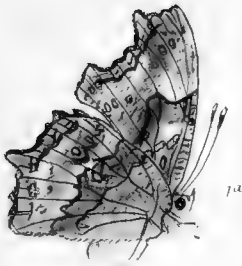
2d



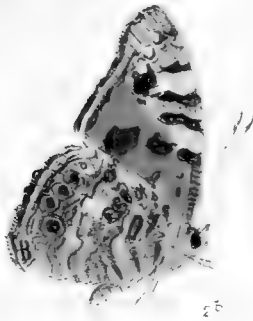
2e











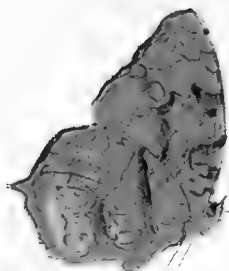




1a



1b



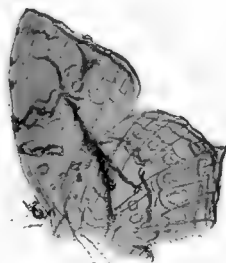
1c



1



1d



1e

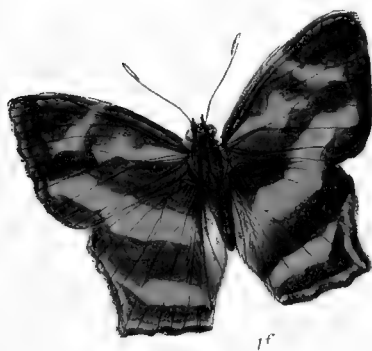


1f



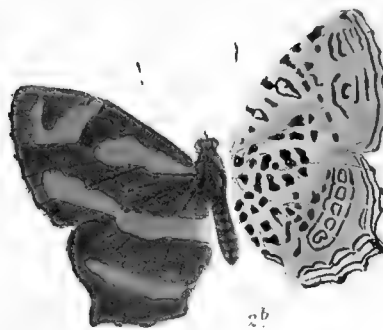
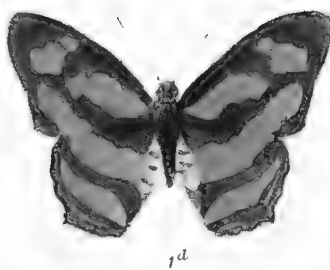
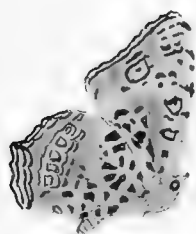
1g















1



1b



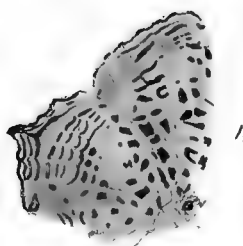
1a



1c



1e



1f



1d



1f





1.



1b



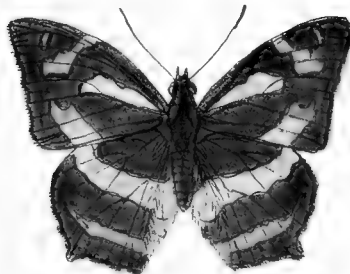
1a



1c



2a



1d



1e



2



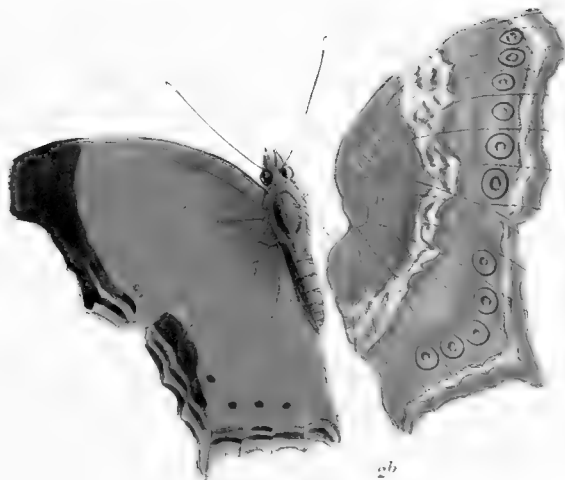
2b



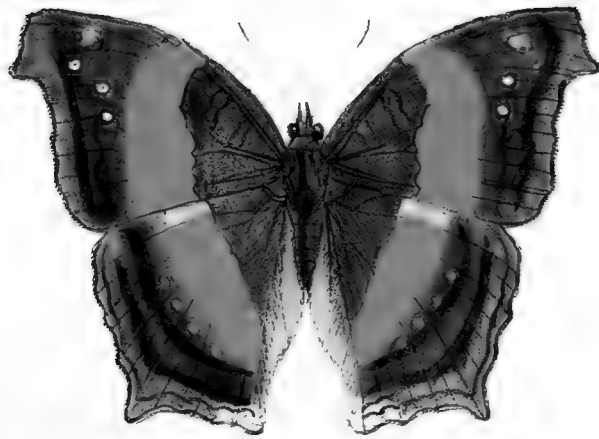












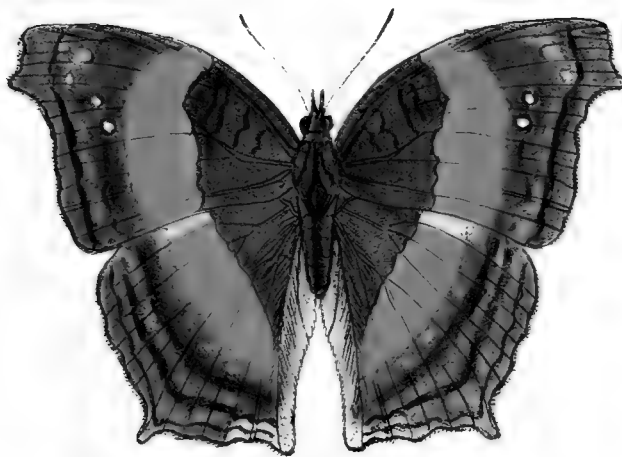
1



1<sup>a</sup>



1<sup>c</sup>



1<sup>b</sup>





1a



1b



1



1e



1f



1g



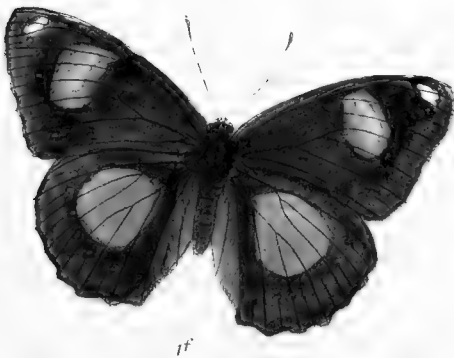
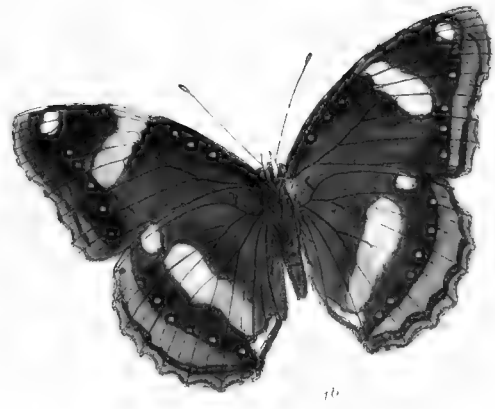
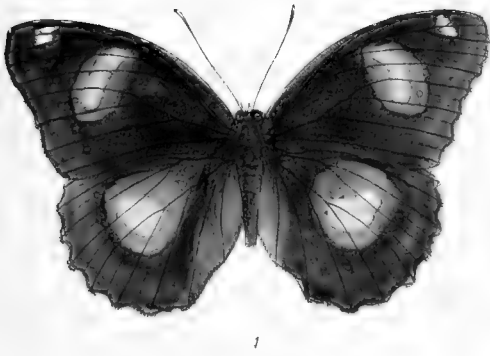
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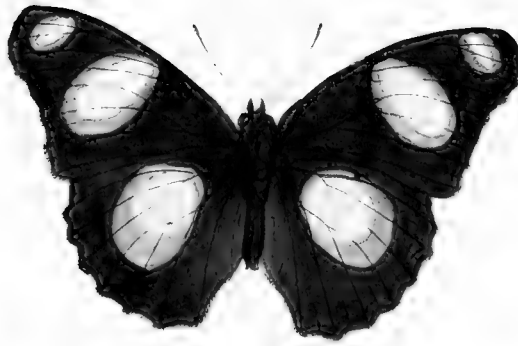












1.



1c



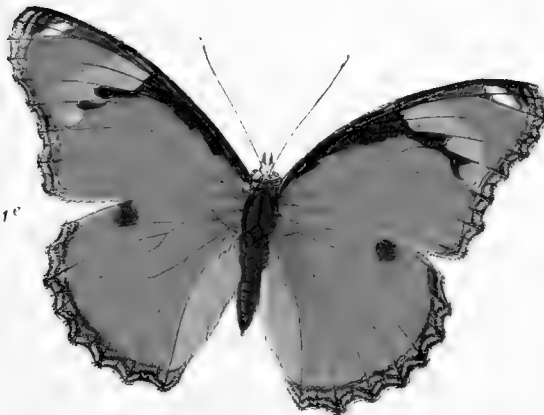
1a



1b



1d

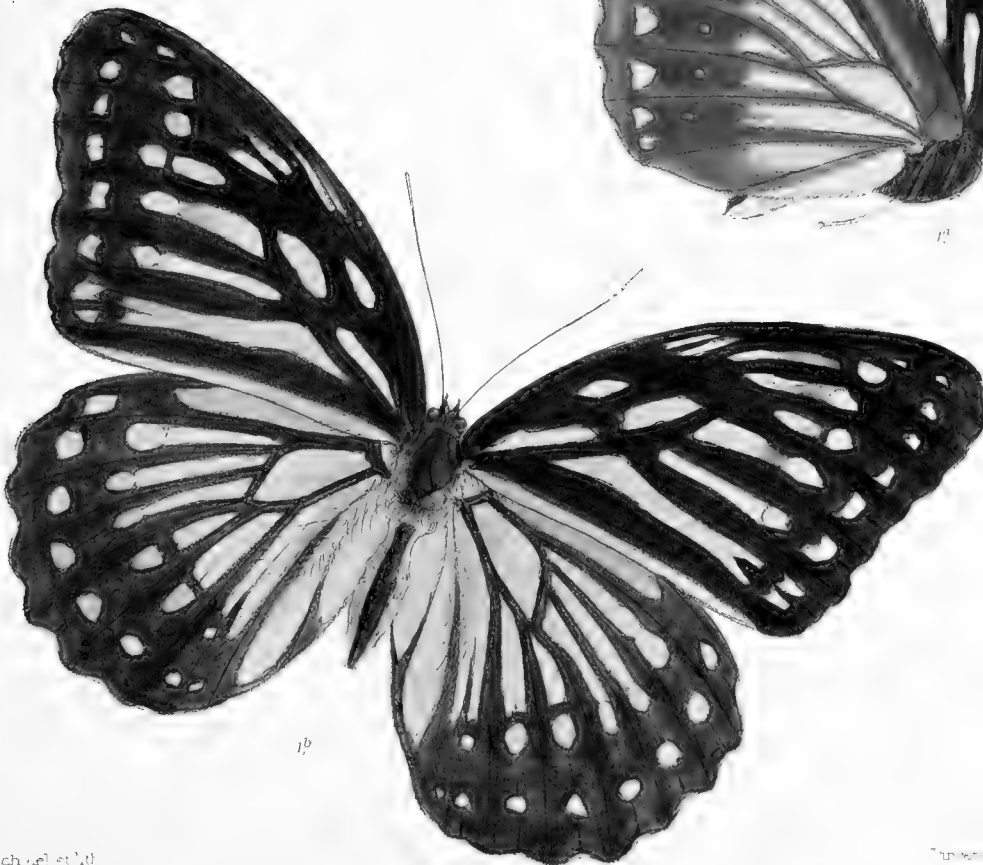
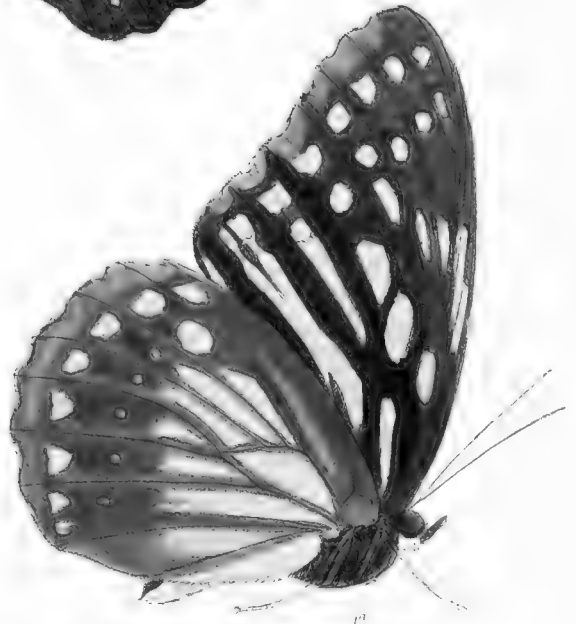


1e

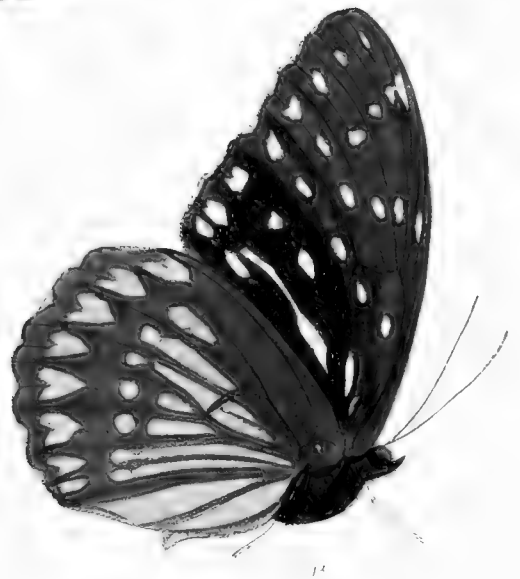


1f







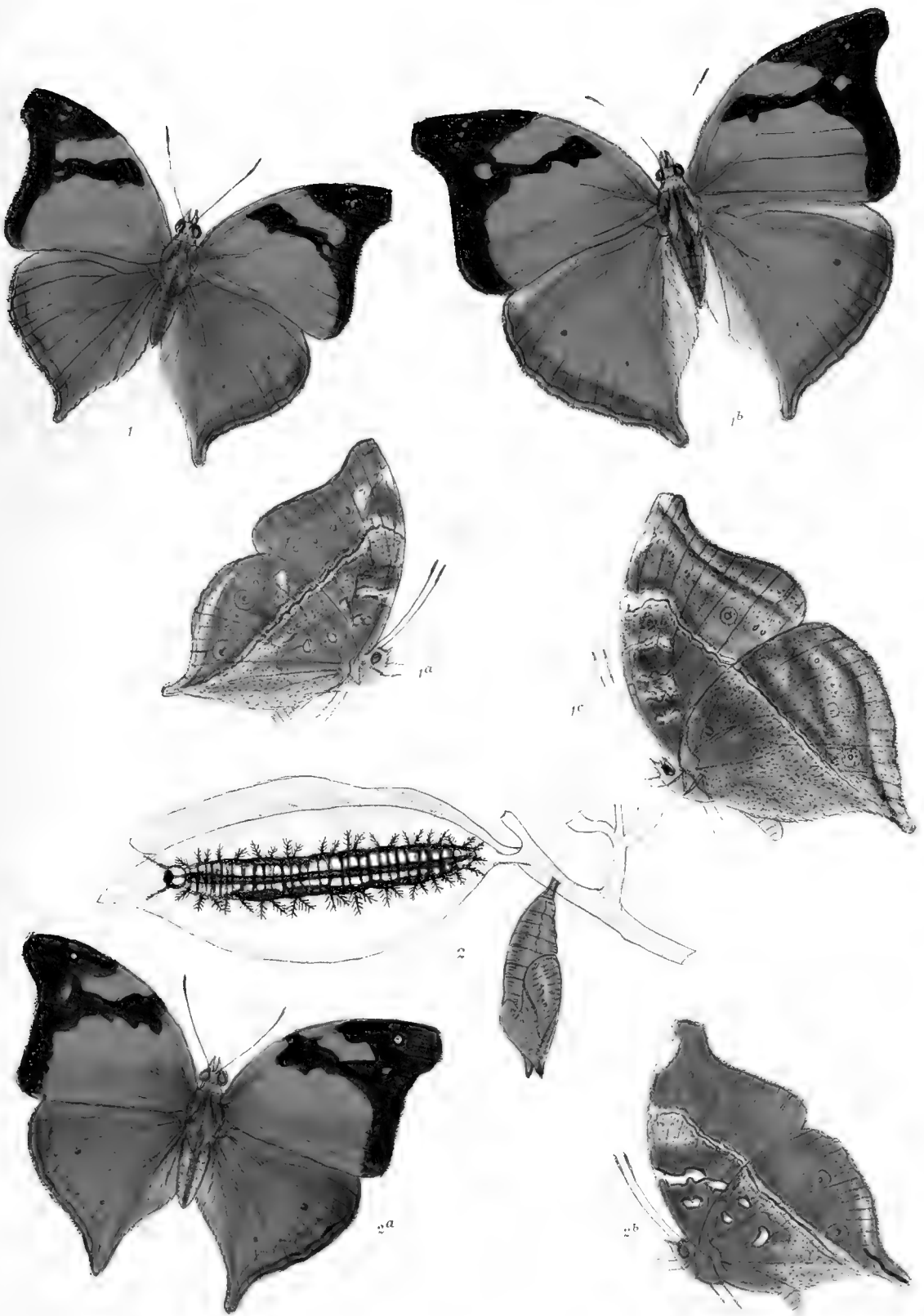




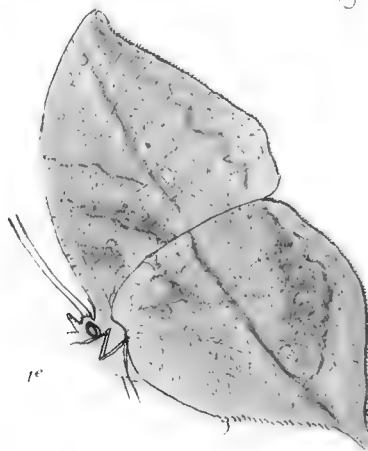
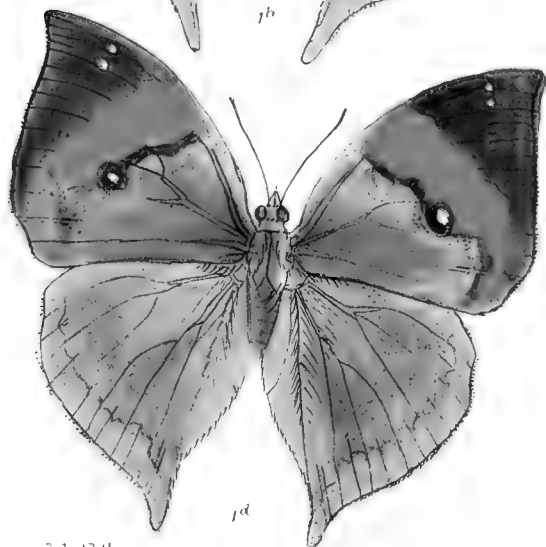
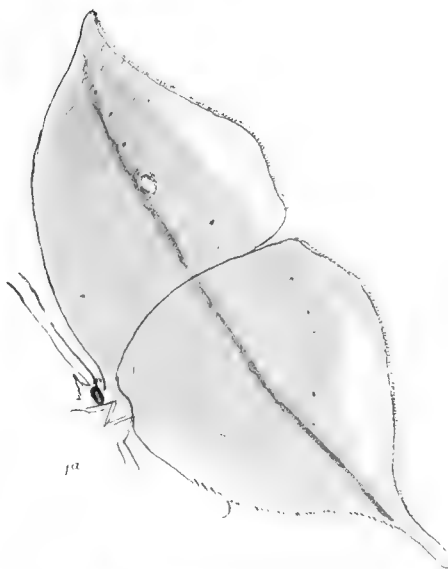










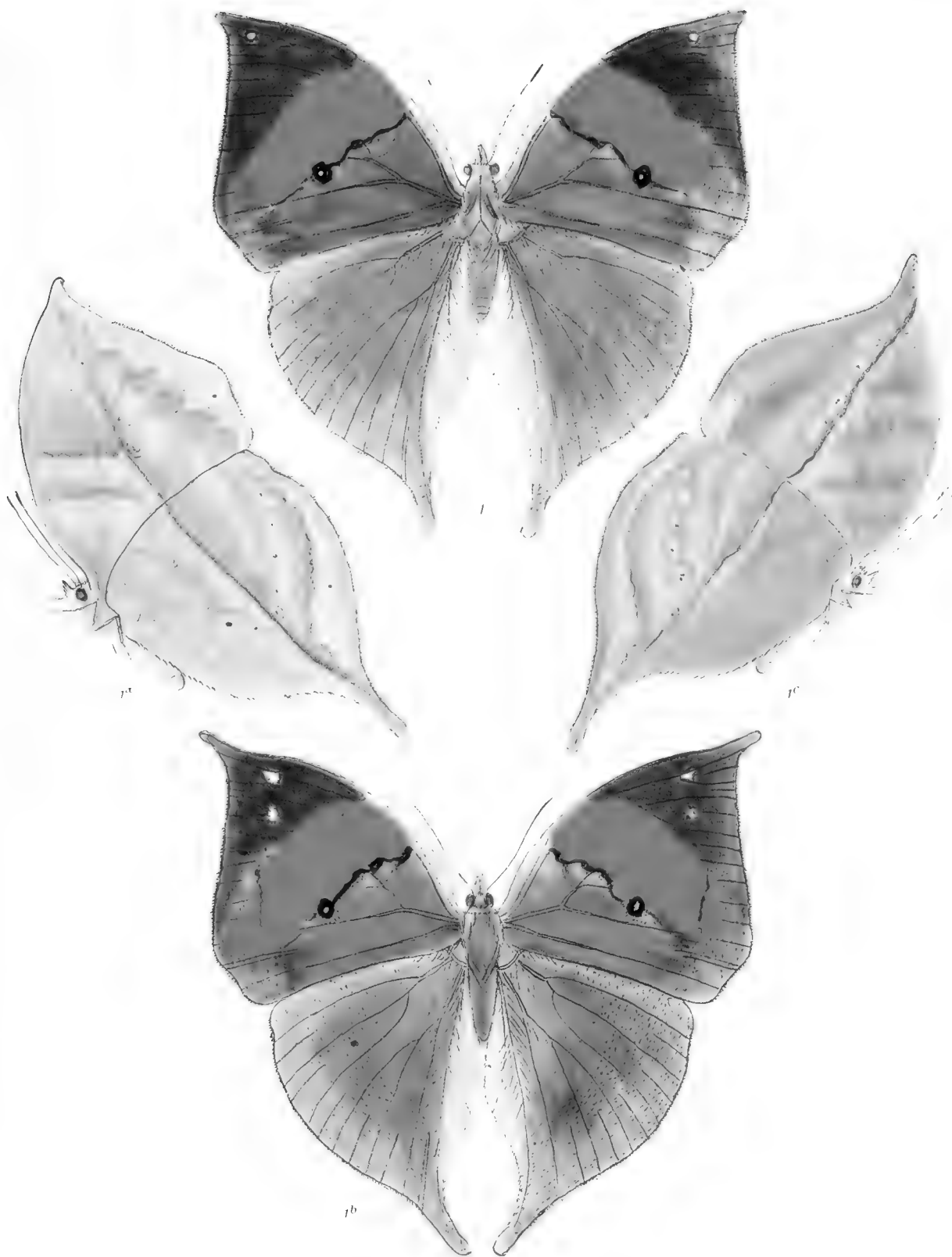


F.C. Moore del et lith

Vincent Brooks, Day & Son Ltd Imp

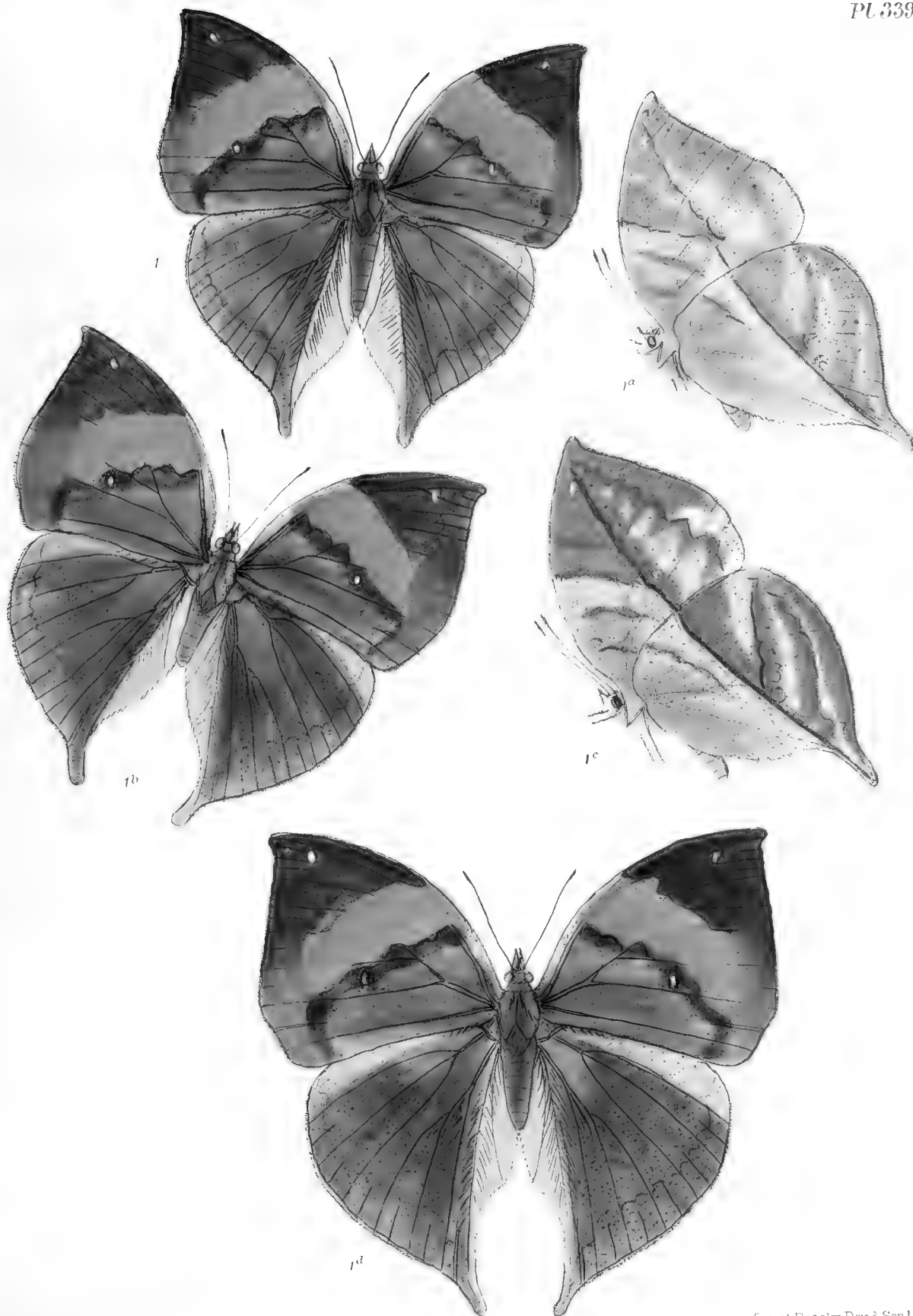
L. Reeve & Co London

















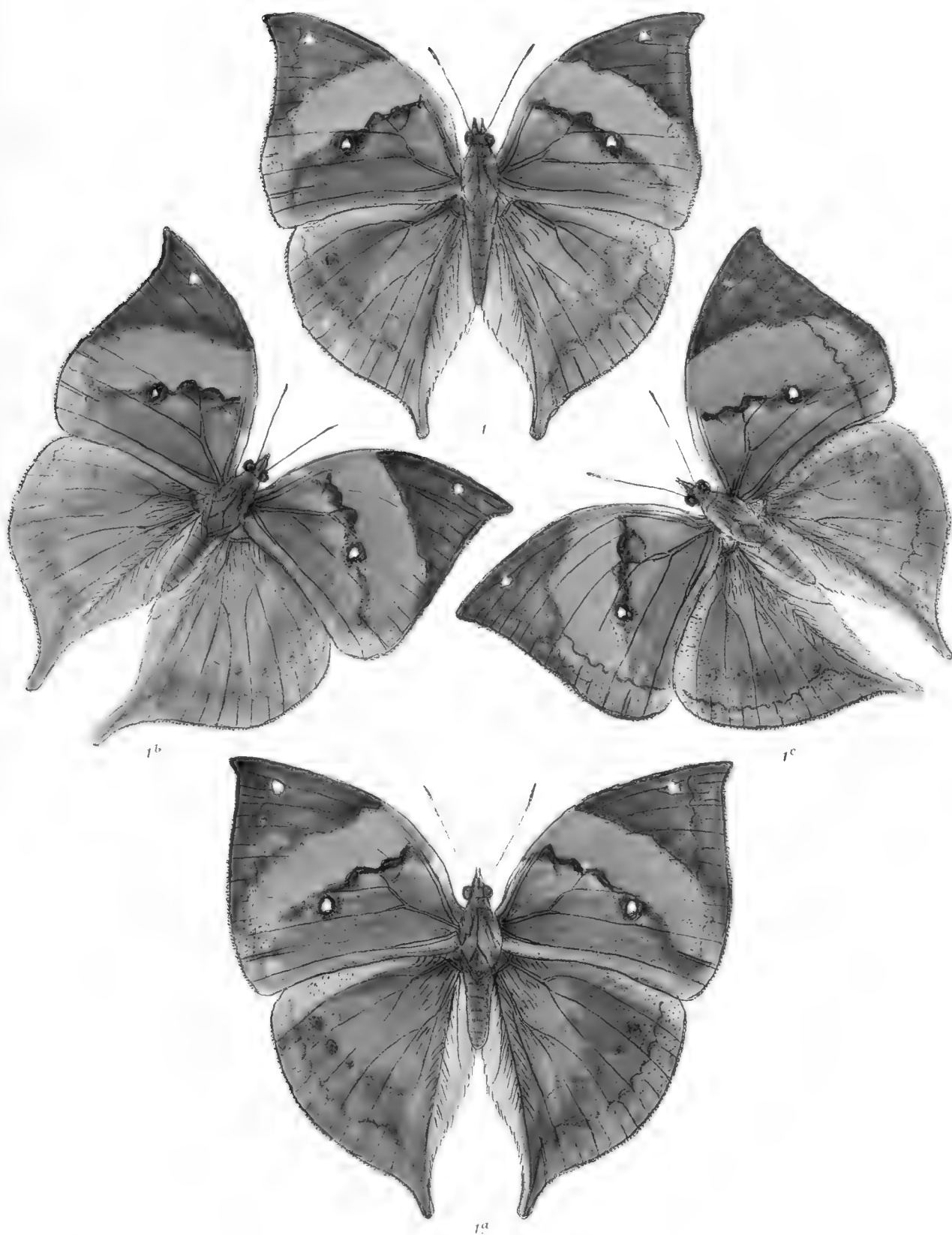


1871. 1872. 1873.

Vincent Brooks. Day & Son Lith.

1871. 1872. 1873.







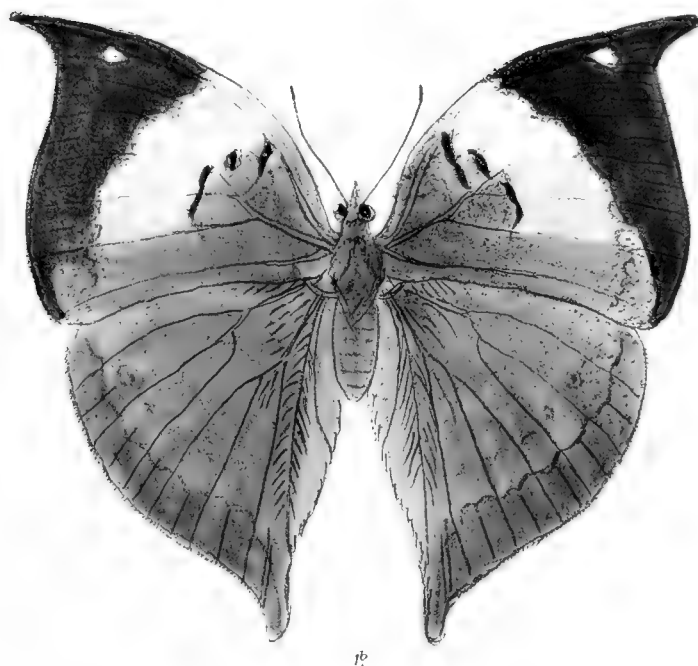










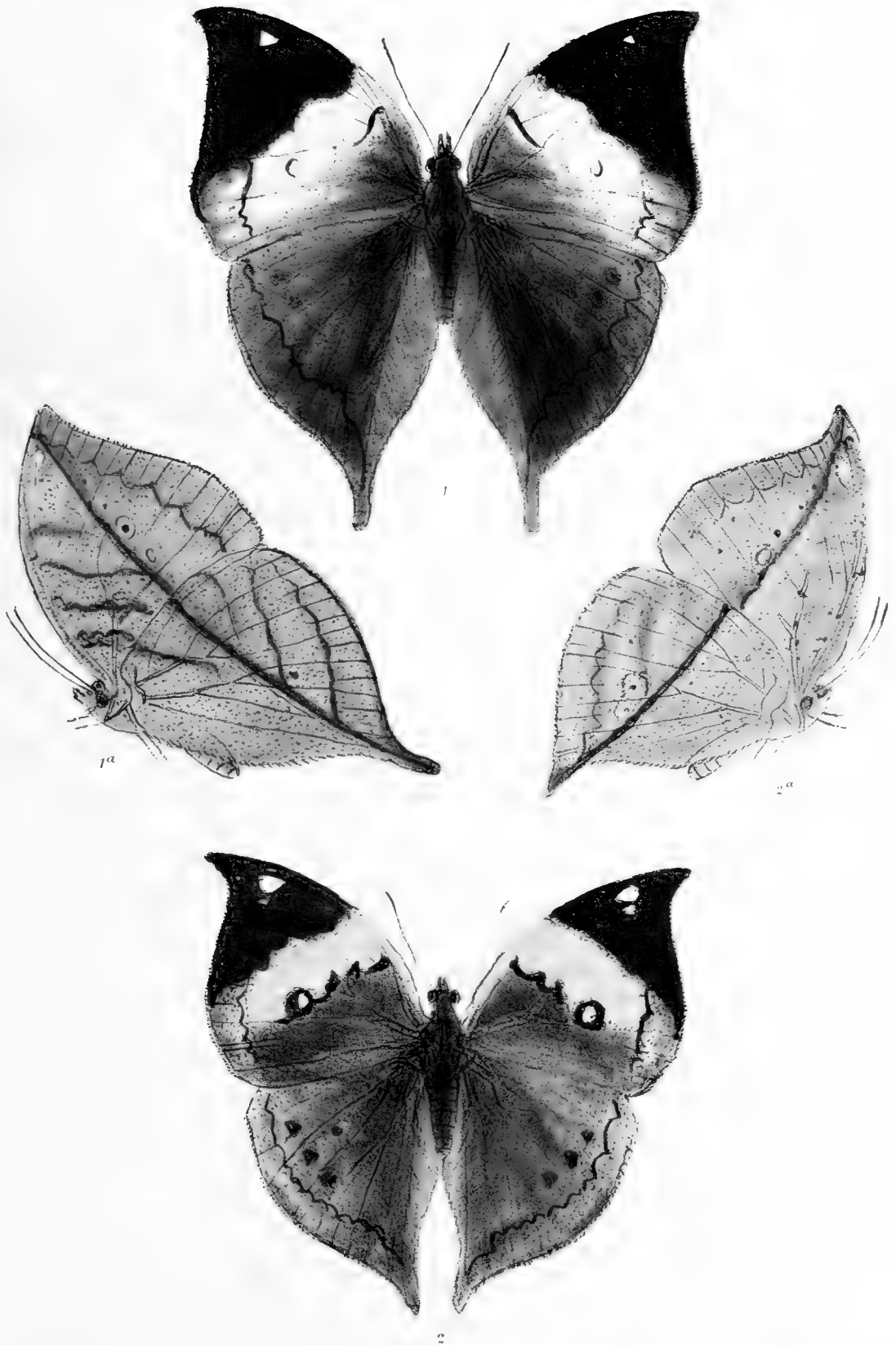




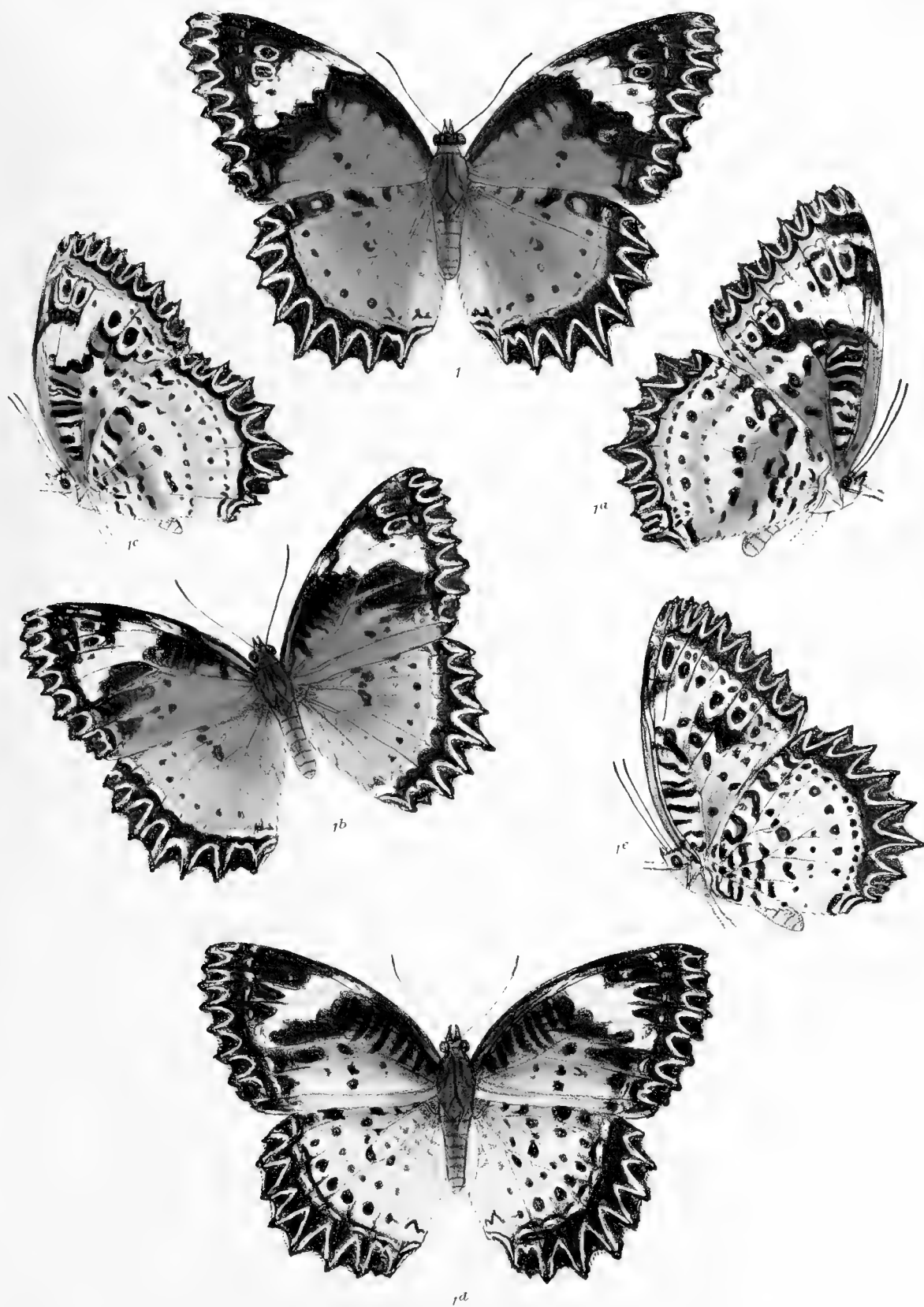
















1



1c



1a



1b





1b



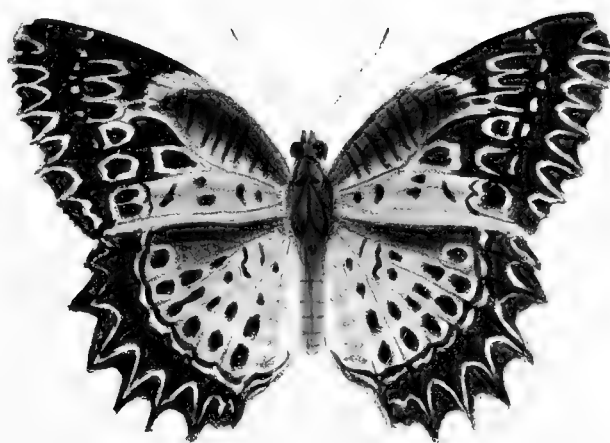
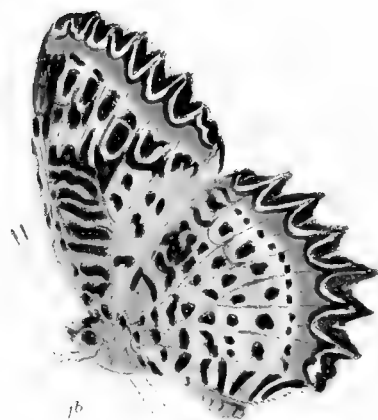
1a



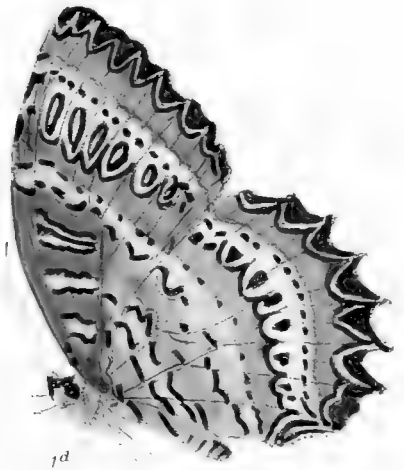
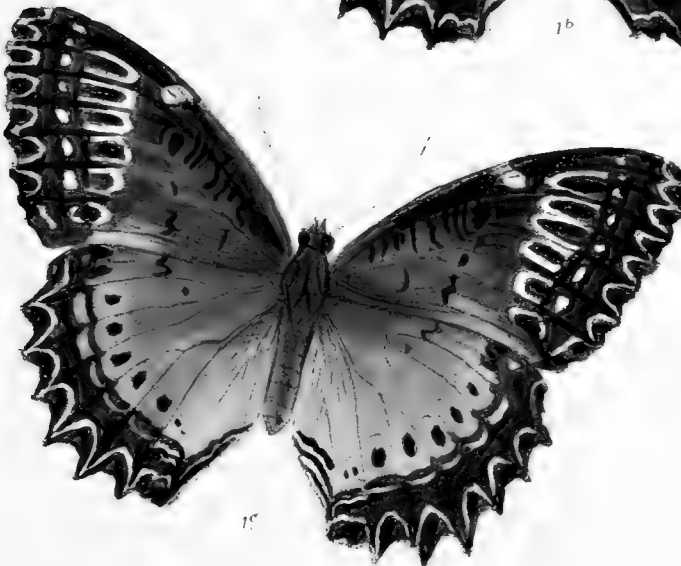
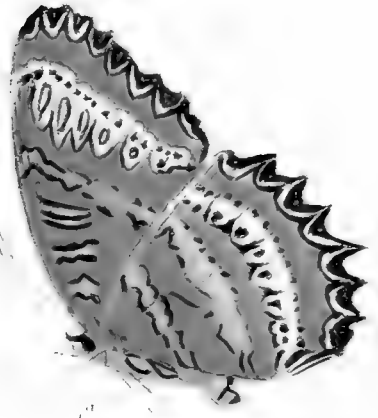
1c







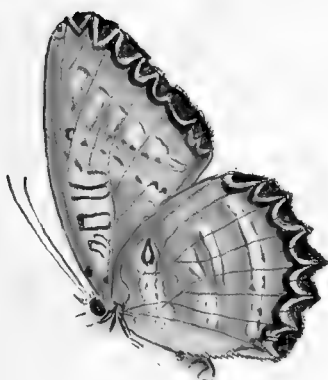








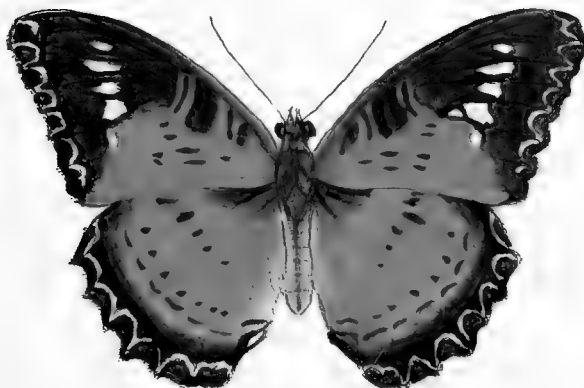
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1a

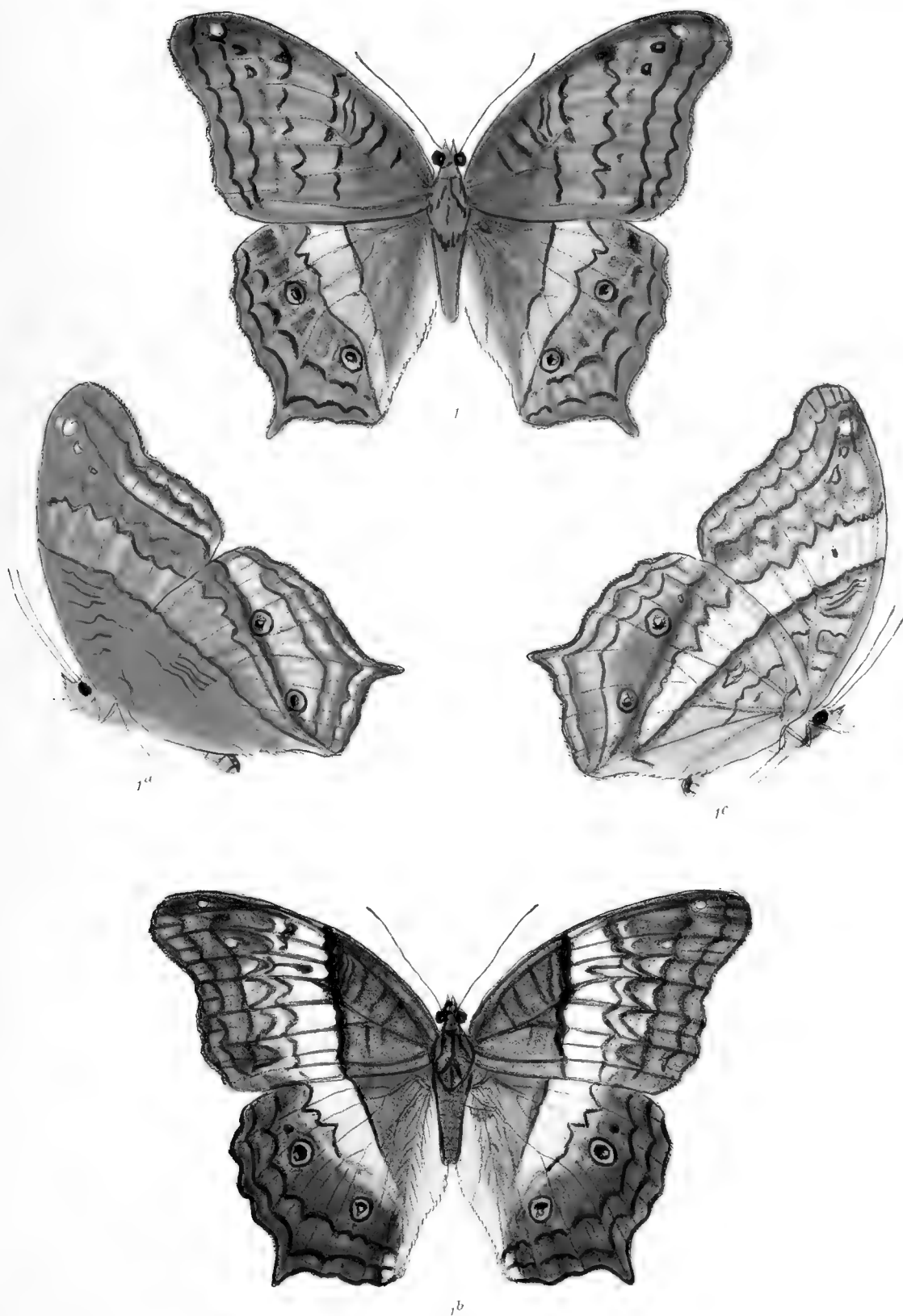


1b



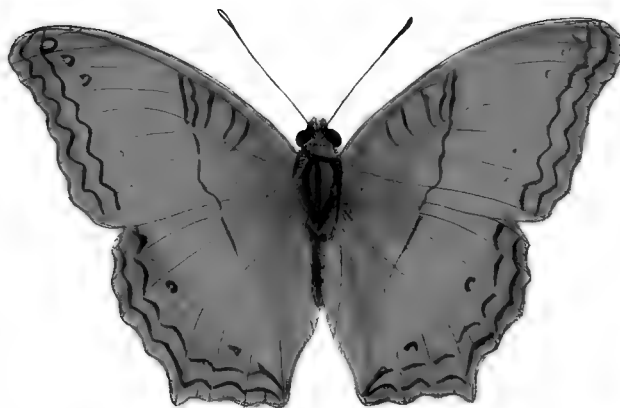
1b







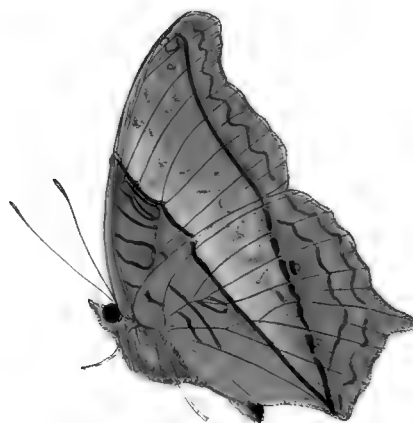




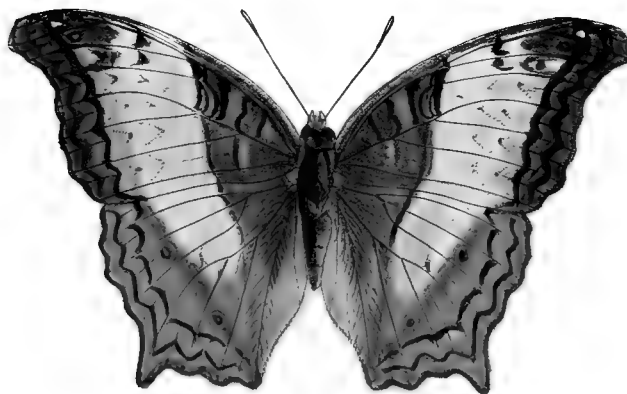
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1<sup>a</sup>

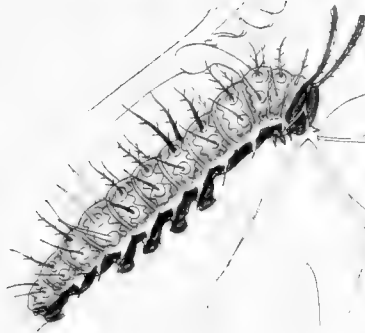
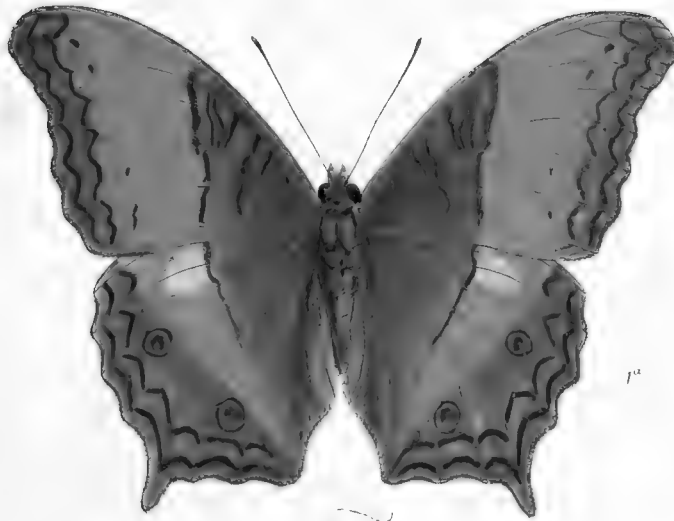


1<sup>c</sup>

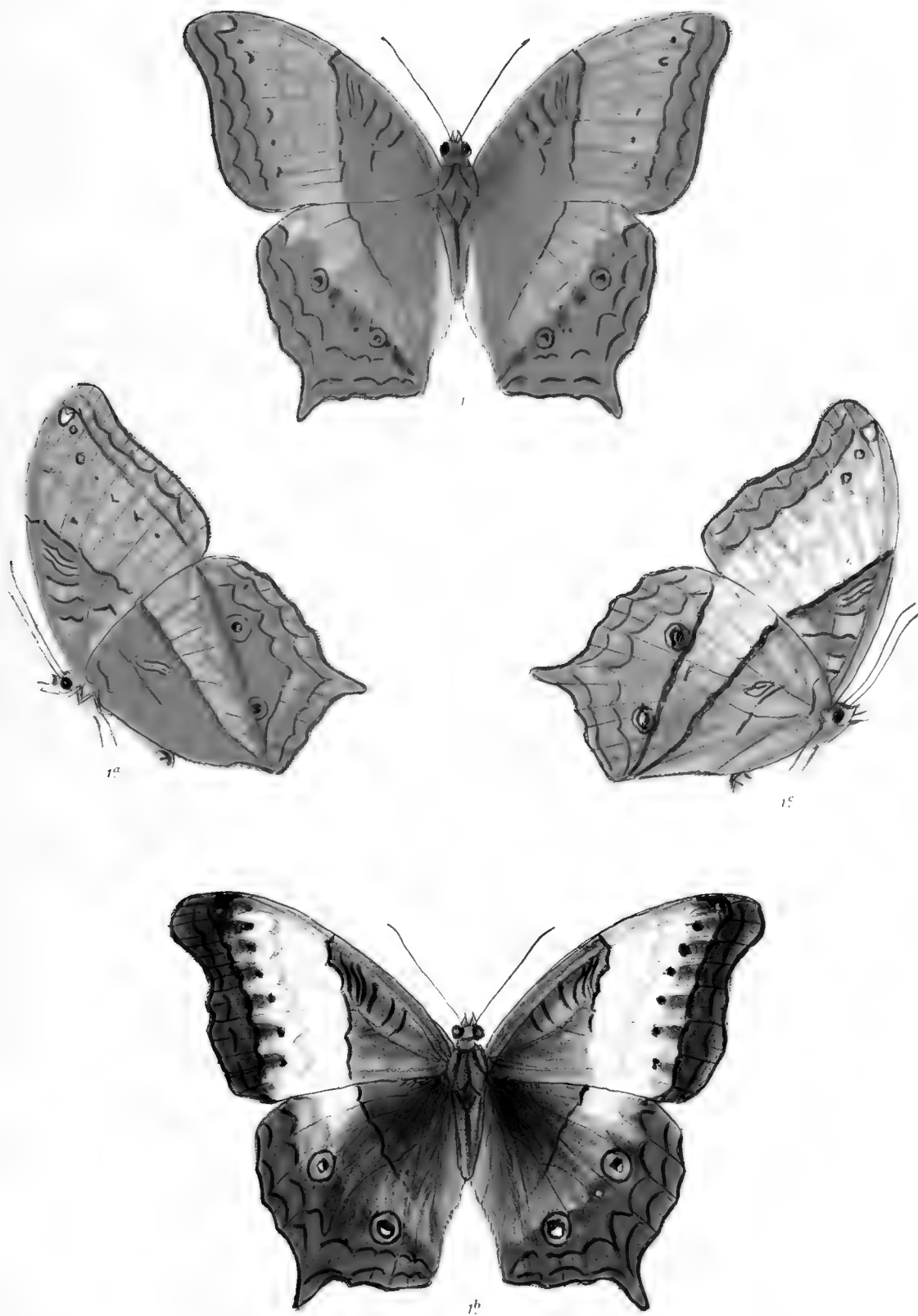


1<sup>b</sup>

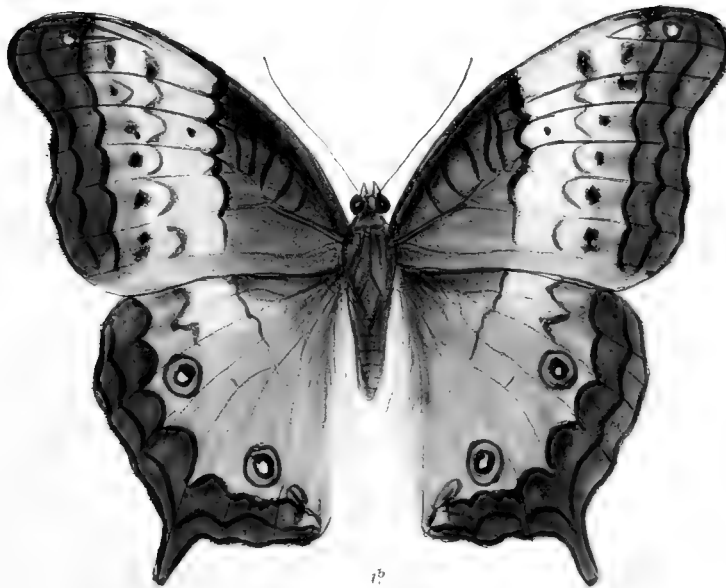
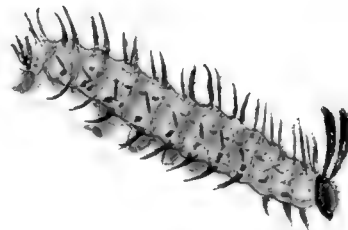
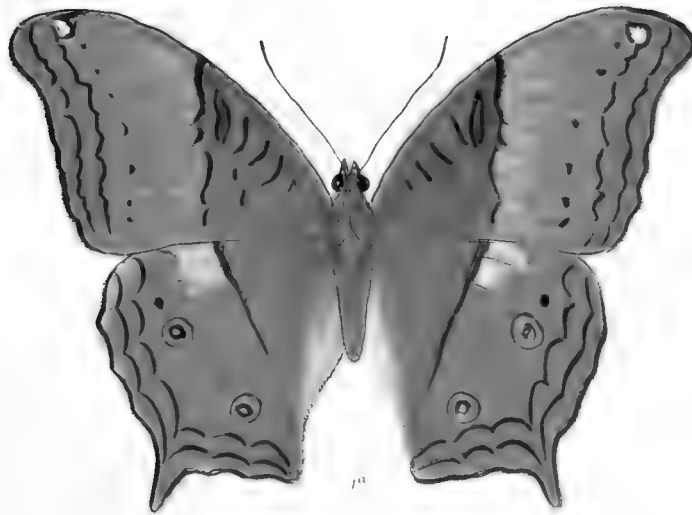






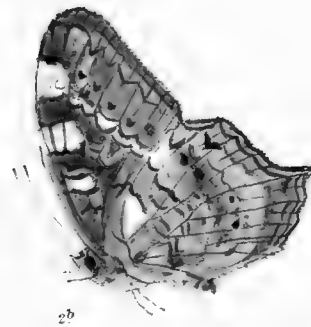




















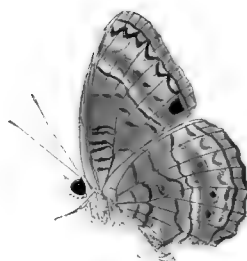
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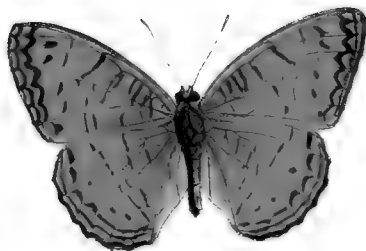
1b



1a



1d



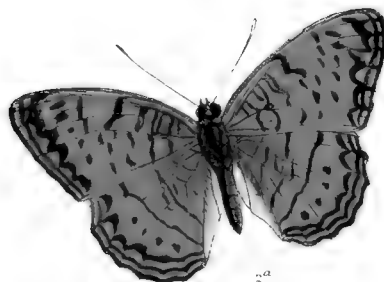
1c



2



2b



2a





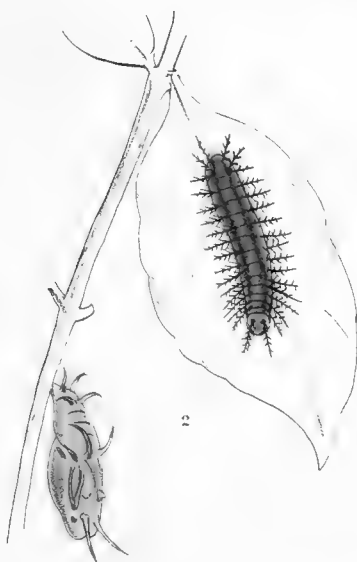
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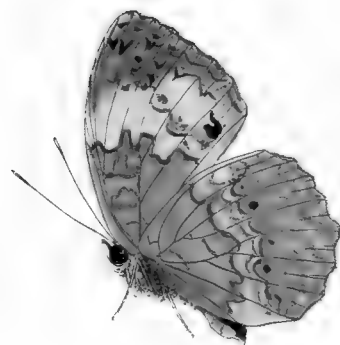
1b



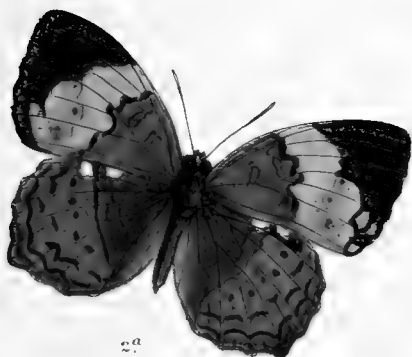
1a



12



1c



2a



2c



2b







1



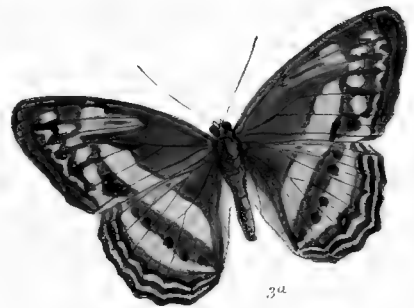
1a



2



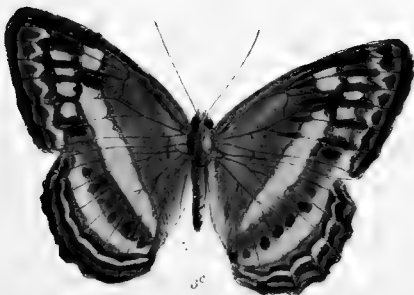
3



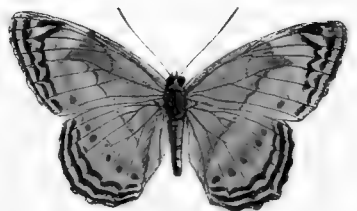
3a



3b

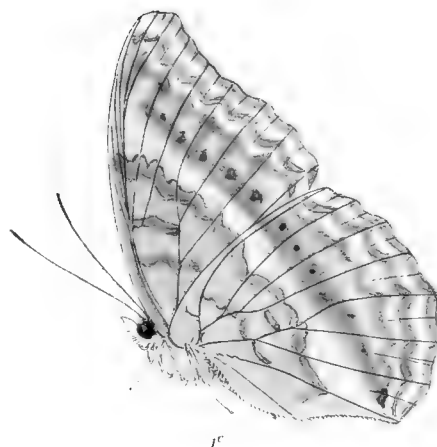
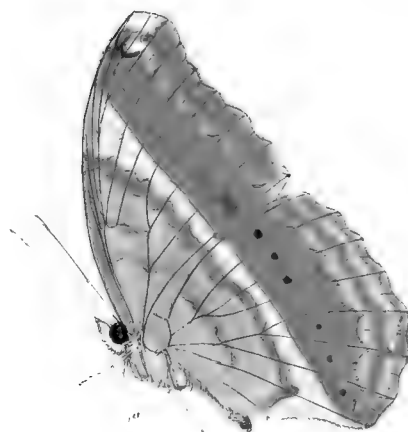


3c

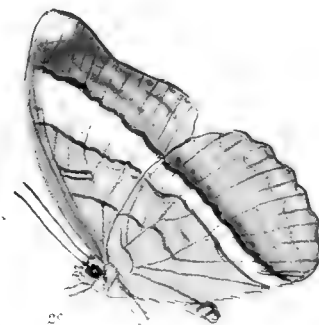
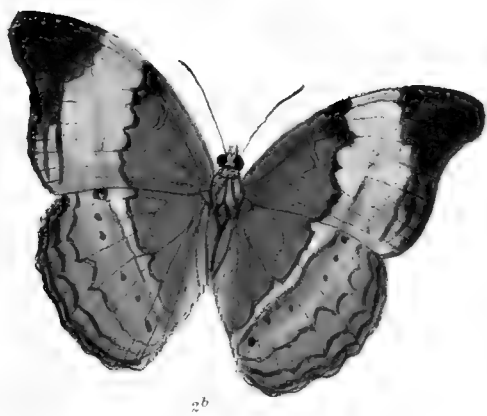
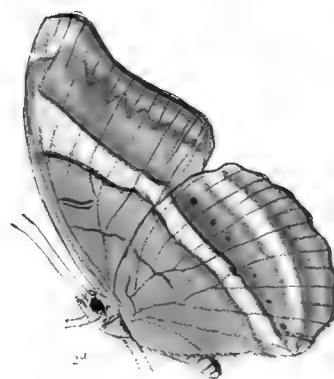
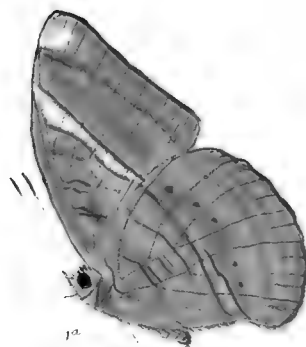


4

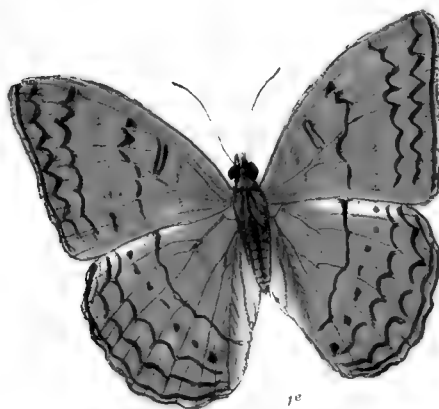
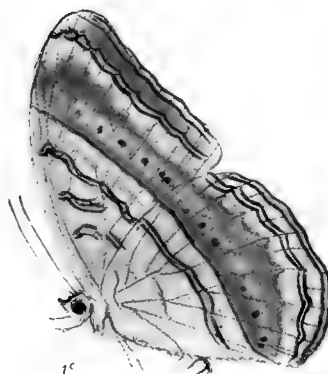
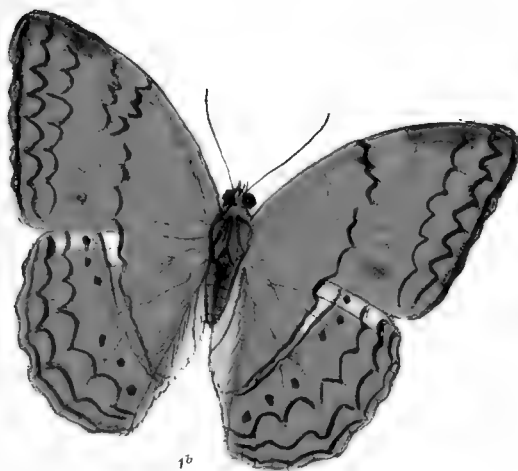
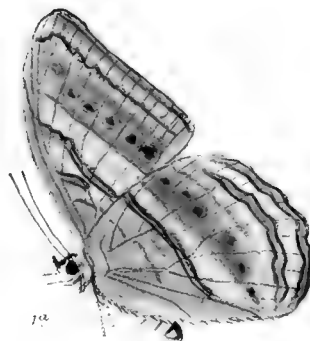






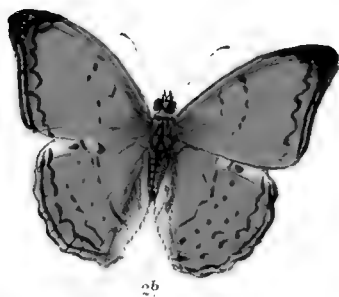
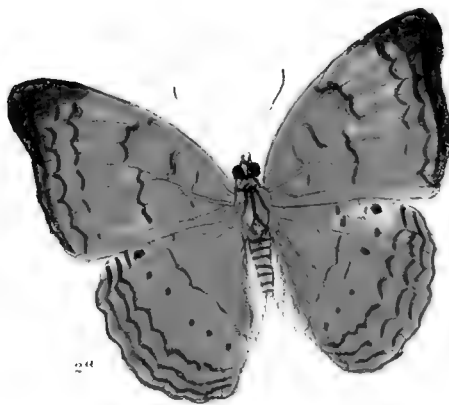
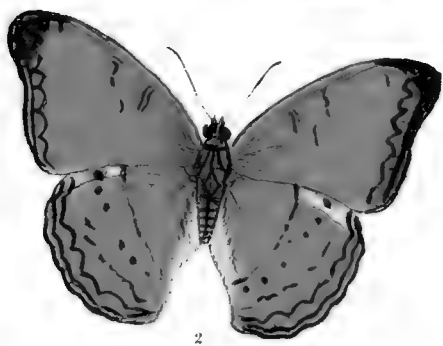
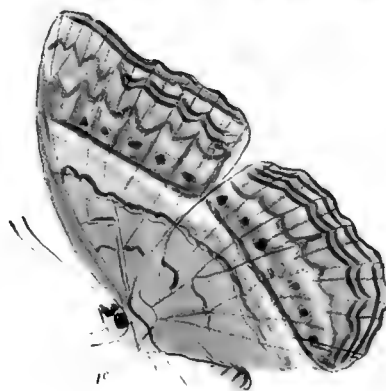
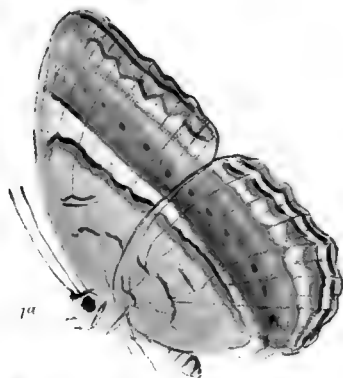
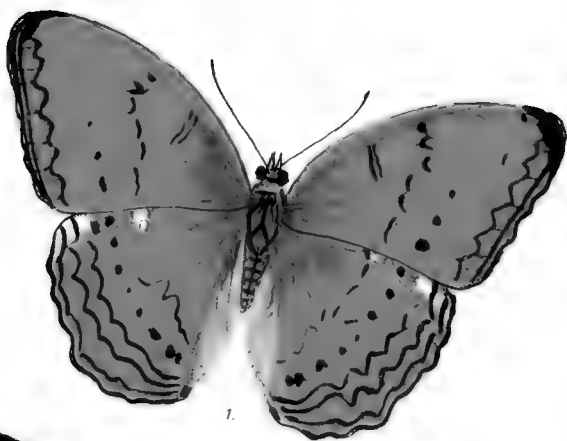




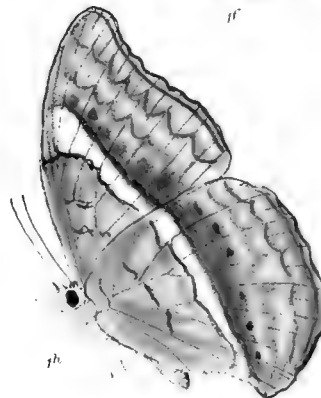
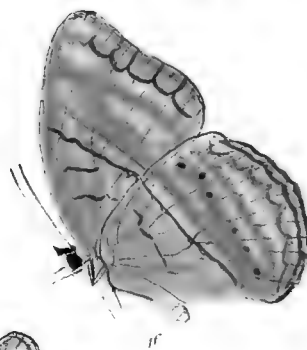
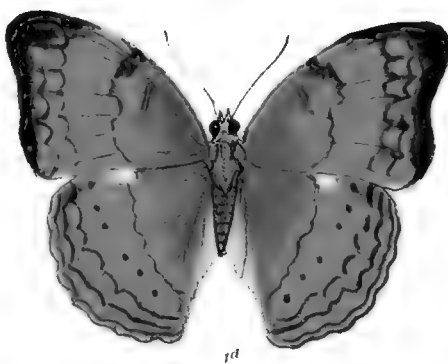
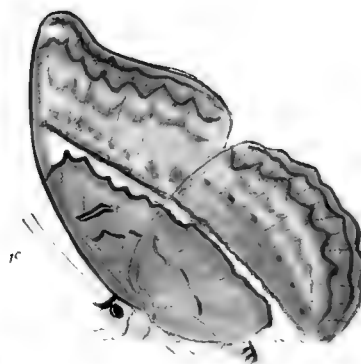
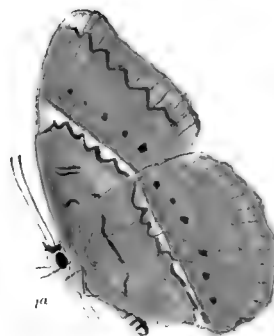




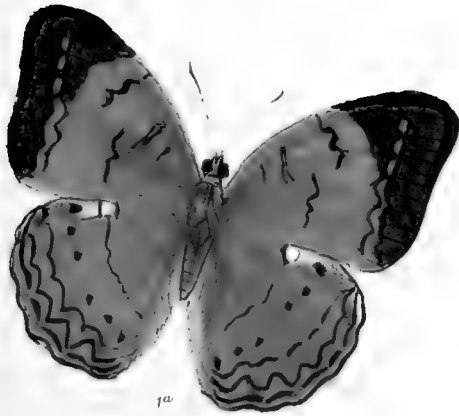




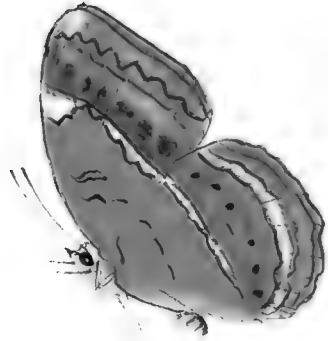








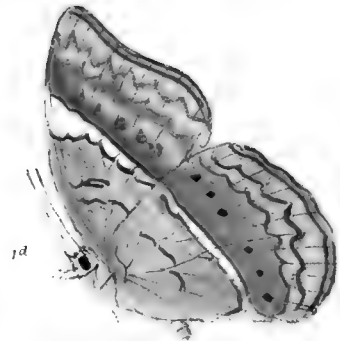
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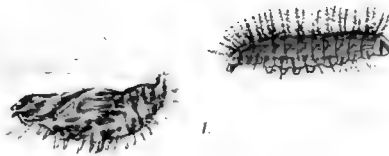
1b



1c



1d



1e

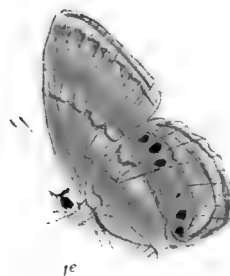
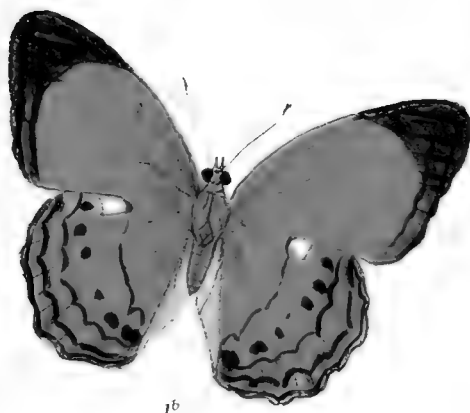


1f



1g



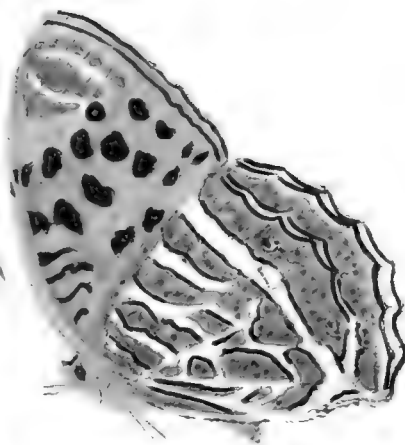




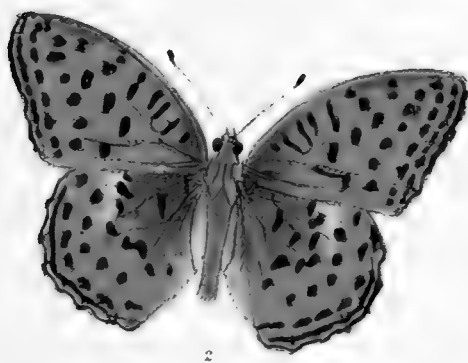
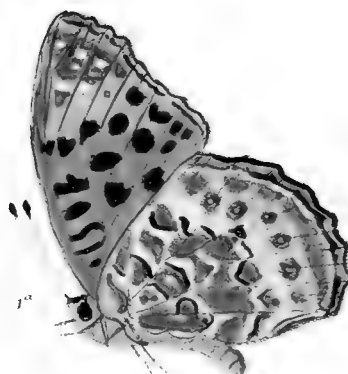




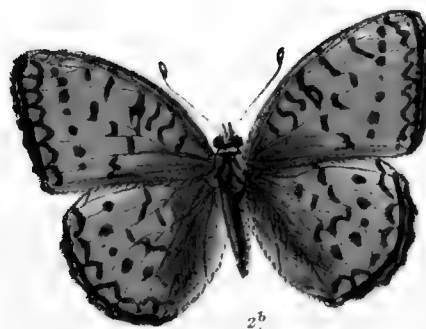






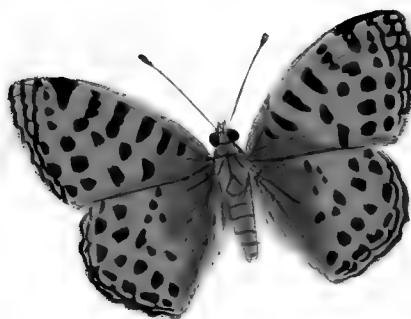




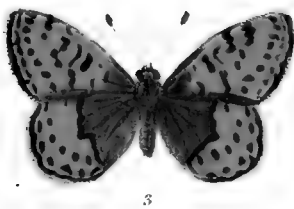
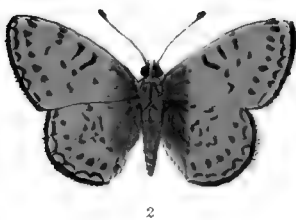
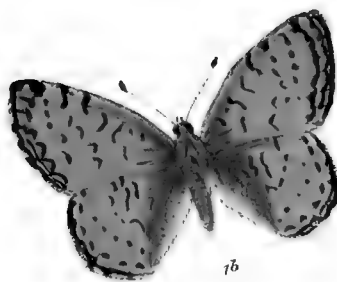












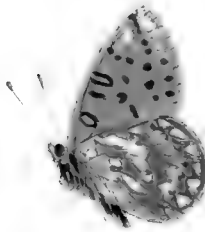




1



2



3



4



5



6



7





Fig. 1. d. s. v.

Fig. 1. d. s. v.











